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The Outlook

The New Commanders

A NEW Chief of Staff will usually pick his own team, and Air Chief Marshal Sir Charles Portal has followed the rule. If ever a man deserved a rest, it is Sir Hugh Dowding, and the terms in which his mission to the United States has been announced make it clear that there is nothing derogatory to him in the change of Fighter C.-in-C. Sir Hugh has won the Battle of Britain, and he has received the Grand Cross of the Bath from the hands of H.M. the King. His name will go down to history with honour. After a more than usually arduous term of command he now gives way to a considerably younger man, and in Air Marshal Sholto Douglas the Fighter Command gets a man who won distinction as a fighter pilot himself in the last war, and has been known since for his energy and drive. It is to be hoped that his term of office will see less critical times than Sir Hugh Dowding had to face, but the problem of dealing with the night bomber still awaits solution. Probably scientists have more say in that matter than the C.-in-C. will have, but when weapons are made available they still need brains in their use, and it is for the C.-in-C. to supply them.

Air Vice-Marshal Boyd deserves every sympathy for his misfortune in being taken prisoner by the Italians. He had done great work in expanding the Balloon Command, and would doubtless have welcomed the opportunities of more active operations as deputy to Sir Arthur Longmore in the Middle East. Now a new deputy will have to be found, and it is to be hoped that he will have better fortune in his trip to Cairo. The Balloon Command goes to Air Marshal Gossage, another vigorous personality, who has held a number of important posts since the outbreak of war. Perhaps he may find the Balloon Command a rest by comparison after his recent jobs.

Comparative youth also marks Sir Charles Portal's choice for Deputy Chief of the Air Staff, for Air Vice-Marshal A. T. Harris is only 48. He has not been much in the public eye, but we may feel sure that the C.A.S. knew his man and had good reasons for selecting him as his deputy. No doubt everybody will hear much more of him in the future.

The Command in Greece

ONLY last week we commented on the appointment of Sir Robert Brooke-Popham as Commander-in-Chief of the Far East. Now another Air Force officer is given a command which may put him over Army troops. Air Commodore D'Albiac has been appointed to command the British forces in Greece. There are not likely to be many British soldiers in that country, for the Prime Minister has said that the chief help which we should give to Greece would be on the sea and in the air. Already the elements of the R.A.F. which have established themselves in Greece have made themselves felt. They have been active in raiding the Italians and have attacked their bombers. In addition, their presence gives great encouragement to the very gallant pilots of the Greek air arm. Our air help will increase, but it is not a speedy business to establish squadrons in a new country where no previous preparations had been made for their reception. Nor must we forget that the Italian squadrons in Libya must be contained, while there is always the chance of German aircraft appearing in Greece. Still, it is air help which we are chiefly giving in the land fighting, and therefore it is appropriate that an Air Force officer should be placed in command of whatever British forces are sent to Greece.

The Greeks have already expressed their gratification at the help the Air Commodore has given them.

Three-wheelers

THE description which we publish this week of the new General Aircraft trainer revives the subject of tricycle undercarriages. There was a time when arguments for and against grew quite heated in the aviation world. Then came the war, and immediate necessities in the form of production problems swamped all other considerations. That was but natural, and indeed inevitable. The *Blitzkrieg* threat, and its actual although not very successful consummation, left no course open but to concentrate on that which we had; there was no time to plan very far ahead.

Now, however, the first onslaught has been stemmed, and we have a breathing space in which to think of the future. Among the features which must be considered is the tricycle undercarriage. Not only are we committed to its use by having ordered American aeroplanes incorporating it, but those responsible for design policy at the Air Ministry must come to a decision. If the three-wheeled undercarriage is to serve its purpose efficiently, the aeroplane must be designed around it, so to speak.

Our contributor "Indicator," in our issue of August 15, recorded his impressions of flying the Douglas DB-7. He particularly stressed the tendency to over-correct when checking a turn on the ground by means of the wheel brakes. There are other operational peculiarities of the three-wheeler, but they are probably more apparent to the pilot who has done all his previous flying on the orthodox type than they would be to the pupil doing his *ab initio* training on a tricycle.

There is a good deal to be said on the subject, both for and against, but bearing in mind that raids are likely to increase in range and duration, and that therefore the crews will have to spend longer hours in the air, it seems logical to argue that the designer should do everything he can to make their task easier.

To expect a tired pilot, returning from a long raid, to make a perfect landing in the dark, or at any rate down a flare path, is surely rather unreasonable. The three-wheeled undercarriage should make landings much easier, and at the very least should make the penalty for a not-quite-so-good landing less severe. So on balance one would vote the tricycle worth while.

We are not overlooking the drawbacks, nor the additional problems which the designer will have to solve. But do not let us forget that for many years—too many, in fact—designers fought shy of the retractable undercarriage because of its extra weight and complication. In the end circumstances compelled them to adopt it, and so it may well be with the "trike."

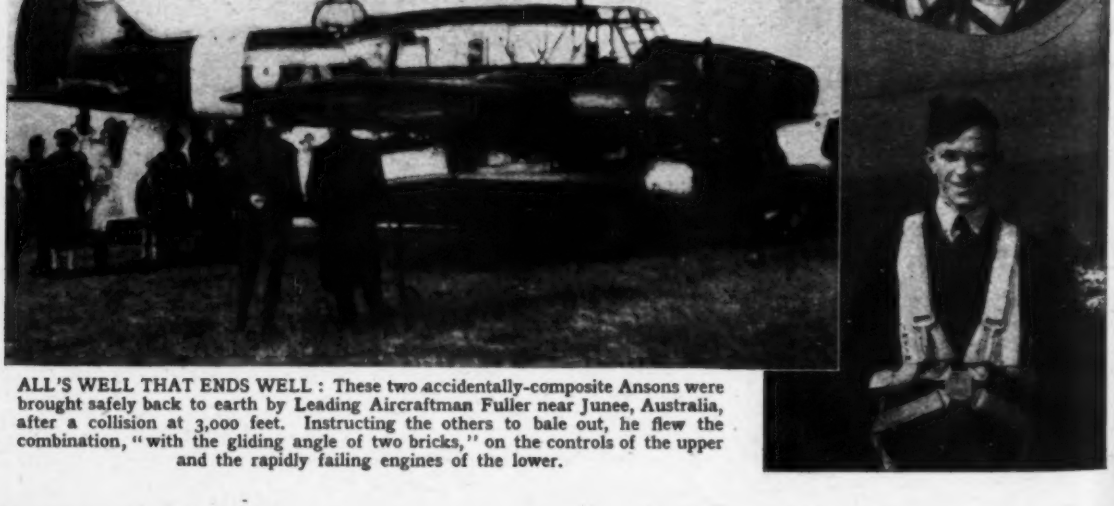
The "Slip-wing" Scheme

AS we expected, the publication in the last two issues of *Flight* of the article by Mr. Pemberton-Billing on his "slip-wing" aeroplane has caused widespread interest. Letters have reached us from many quarters, not all intended for publication, and we know that others are coming along. This week we have had space for but one letter on our Correspondence page on this subject.

Our contributor argues, as most people probably would, except "P.B." himself, that the long-range bomber will always be slower than the short-range fighter, provided both are given the same advantages in the matter of assisted take-off. It is difficult to see how it could be otherwise, as the guns of the fighter can be entirely "buried" so far as wing guns or nose guns are concerned. And the weight of guns and ammunition that could be carried by a fighter assisted into the air by the slip-wing would be such that the pilot, instead of having to conserve his ammuntion, as he does in the present-day fighter, could afford to be more liberal in his expenditure of it, with consequent improvement in the chances of scoring an effective hit.

Manœuvrability, at the speeds contemplated, would probably set a limit to the effectiveness of such a fighter. Certainly, so long as the bomber kept to a speed of 400 m.p.h. or more, the fighter pilot would have to watch his step, as he would have to be doing something like 450 to 500 m.p.h. to have much chance of closing with the bomber.

BELIEVE IT OR NOT



ALL'S WELL THAT ENDS WELL: These two accidentally-composite Ansons were brought safely back to earth by Leading Aircraftman Fuller near Junee, Australia, after a collision at 3,000 feet. Instructing the others to bale out, he flew the combination, "with the gliding angle of two bricks," on the controls of the upper and the rapidly failing engines of the lower.

WAR in the AIR

The War in Greece: Successes in Africa

THE Mediterranean and Greece are still the chief centres of interest, and the fight which the Greeks are putting up has filled all the neutral world, as well as the Allies, with admiration. In particular, the little Greek air arm has been doing remarkably well. In the main it has been modelled on the R.A.F., and has struck out in various directions against the Italians. In Greece there are four main aerodromes, Tatoi, near Athens, Eleusis, Larissa, and Salonika, and there are about a dozen landing grounds, mainly in the north of the country. All, except those near Athens and Salonika, are apt to be flooded in winter. The R.A.F. units which have been landed in Greece have been accommodated on aerodromes which can be used all the year round. In Crete there is a useful aerodrome at Heraklion which may be used by the R.A.F., as well as a seaplane base. Of course, it takes some time to get an immigrant air squadron settled down, especially when no previous arrangements had been made for its reception, and this fact delays the full help which the R.A.F. is anxious to send to Greece. In disposing of its units the Middle East Command still has to contain the Italian Air Force units which are with Marshal Graziani in Libya, and has also to bear in mind the possibility that the Germans may send air reinforcements to help their Axis partner. However, the British and Greek airmen, though outnumbered, are making up by their aggressive spirit for that deficiency. On Tuesday, November 19, a squadron of R.A.F. fighters shot down nine Italian machines, all of them fighters, and only had one of their own pilots slightly wounded. Either that day or the next, Greek pilots shot down 11 Italian machines. On one occasion a Greek fighter pilot rammed an Italian bomber and then escaped himself by parachute. That shows the spirit in which the Greeks are defending their country.

Confused Italian Ideas

THE *Regia Aeronautica* seems to have started this campaign with muddled ideas. Evidently the Fascists expected Greek resistance to collapse very quickly, and so they bombed Salonika and other places in the hopes of breaking down the *moral* of the country. When this failed, they began to revert to their traditional tactics of using their bombers to support their ground troops. Lately they have used dive-bombers against the Greek infantry and artillery in the mountains, and at first these seemed to have produced some effect. Latest reports from Athens indicate that the Greek troops have begun to learn the art of dealing with the divers with machine guns. The Italians have four centres in Albania from which to operate their aircraft. There are two aerodromes at Koritza, and it is possible that these have firm runways. There are other aerodromes at Valona, Tirana and Argyrokastro, all of which are apt to get waterlogged in the winter. The Italians can also send in bombers from the mainland of Italy and from the Dodecanese—though naturally the British occupation of Crete must make the passage from the latter islands somewhat less free from anxiety.

Apart from the work of the squadrons in Greece itself, the R.A.F. is helping by sending bombers to raid bases in Italy, and it is known that heavy bombers have made night attacks on the port of Brindisi. Since October 31, on the mainland of Italy, there have been four raids on Naples,

MULTI-PURPOSE ELEGANCE: Coastal Command Beauforts in "echelon to the right" under a cloud layer. Beaufort is a high performance general purpose aircraft powered by two 1,000 h.p. Bristol Taurus sleeve-valve engines. It is in large-scale production at home and in the Dominions

in which oil tanks were twice attacked, the oil refinery and the harbour each once, and railway lines and junctions on all four occasions; two raids on Brindisi—the main port of embarkation for troops and supplies for Albania—in which the harbour, the naval dockyards, and the submarine pen were each attacked once and railways on both occasions; one raid on Turin, directed against the Fiat works; one against Milan—Seste San Giovanni, directed against the Pirelli electrical plant; one raid against the oil refinery and ammunition dump at Bari. In Albania, in the same period, there have been three raids against Valona, in which the aerodrome was attacked on all three occasions and the docks once; three against Durazzo, where docks, cranes, and warehouses were attacked; one against Santi Quaranta, where docks and jetties were attacked; and one against Konispolis, where the jetty and road junctions were bombed. The Fleet Air Arm is also apt to give the Italians nasty surprises. They do not always know where the carriers are, and when they try to shadow the Fleet their scouting machines are frequently shot down by the Fulmars and other naval fighters. They have spread torpedo nets round the damaged battleships which they are trying to repair, showing how they fear another attack by torpedo-bombers. The Admiralty has made public some of the details of the exploits of the Fleet Air Arm during recent naval operations. On one occasion aircraft of H.M.S. *Ark Royal* carried out a bombing attack on the harbour and aerodrome at Cagliari, in Sardinia. Many bombs were dropped in the target area and explosions and fires were observed. H.M.S. *Ark Royal* was attacked by enemy bombers, but no hits were made and there was no damage and no casualties. During these operations two shadowing enemy aircraft were destroyed by our fighters,

WAR IN THE AIR (CONTINUED)

HOIST BY ITS OWN PETARD: The great Krupps munition works at Essen, which is visited almost nightly by aircraft of the Bomber Command.

and it is also reported that others were probably damaged. All our aircraft returned safely.

On November 8 one Cant 501 which was carrying out shadowing duties was driven off and damaged by two Gladiators. This enemy aircraft was later seen to have come down in the sea. On the same day a formation of seven S.79s was approaching the Fleet and was intercepted by Fulmars. One enemy aircraft was shot down; the remainder were driven off. On the afternoon of the 9th Fulmars shot down one Cant 506. At midday on the 10th one Cant 506 was destroyed by Fulmars, and, shortly after, Fulmars intercepted nine S.79s and damaged one. The remaining enemy aircraft dropped their bombs in the vicinity of the Fleet, without obtaining any hit, and retired. In these operations none of our aircraft was lost and no damage or casualties were caused to H.M. ships.

One of the Italian machines shot down by the F.A.A. was a Cant Z501. It struck the water and two members of the crew of five were unable to extricate themselves; they were drowned. The other three, a naval Sub-Lieutenant, a sergeant-major and a wireless operator, managed to scramble into the Cant's collapsible dinghy. Their chance of survival was exceedingly remote as their dinghy quickly developed a leak. A Sunderland flying boat on patrol spotted the tiny boat, and as it was so far from land decided to investigate. Although there was a nasty swell at the time, the Sunderland alighted on the sea. A rope was thrown to the Italians and one by one they were hauled on board the flying boat. The British crew saw to it that their prisoners were provided with hot food and dry clothes. Later on, when the Sunderland had finished her patrol, the prisoners were landed and expressed their gratitude for the chivalrous manner in which they had been treated. The officer said that they had often been told in their own messes that the British treated their prisoners well. "Now we have seen for ourselves that is perfectly true," he said. "We thought that our end had come. It was all so sudden. The British machine-gun fire was overwhelming."

A fund has been started in Greece to erect a memorial to the first Briton killed in the defence of Greece. His name was Sergt. John Merifield, R.A.F., a rear gunner. A leading sculptor has undertaken to do the work gratis.

Enemy Raiding

IN Africa bombing continues on both sides. The Middle East bombers have been keeping up their blows on the Libyan ports, Tobruk, Benghazi, and the rest. On the other hand Italian bombers have taken advantage of the moon to appear more frequently over the Nile Delta by night. They are said to have shown more enterprise than they were wont to do, which has led to speculations as to whether the raiders have not been Germans instead of Italians. On November 18 Alexandria was raided and 49 civilians were killed and 70 wounded, all in one of the poorer residential quarters.

A squadron of the Royal Australian Air Force has been in action against the enemy over the western desert. They were flying Gladiators, and four of them ran into a superior force of Italian fighters. The Australians shot down five and only lost one themselves. A second R.A.A.F. machine was forced to land, but the pilot was safe.

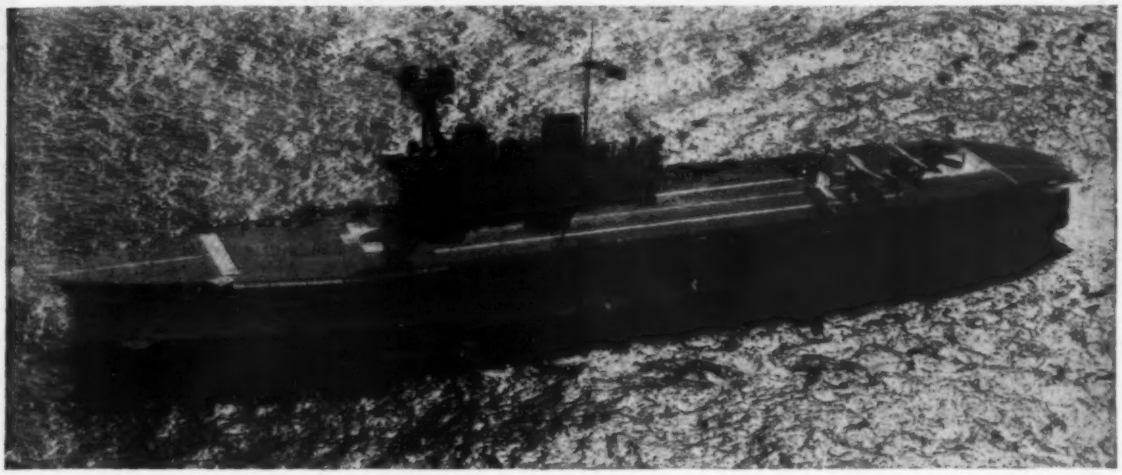
After the savage slaughter in Coventry on the night of November 14, the *Luftwaffe* made heavy attacks on another Midlands town on the nights of Tuesday, the 19th, and Wednesday, the 20th. The Germans themselves have given it out that the place which they raided was Birmingham. German navigators sometimes know which place they have reached, but not always; so the Ministry of Home Security is taking no risks of correcting them if they were wrong. Much damage was done to dwelling houses and other buildings in one district of the town on the Tuesday night and a number of people were killed. The raid was repeated on the next night. The damage and the casualties were not on the same scale as those in Coventry.

During the period of the moon, London suffered a good deal on the night of Friday, November 15, but on subsequent nights fewer raiders came over the capital. One town on the South Coast also had a bad raid recently. On Saturday, November 16, a bomber flew over an island of the Hebrides for the first time, in daylight, and machine-gunned a lighthouse. The German mercantile marine has not much use for lighthouses just now, and naturally classes them with lightships, several of which have been attacked. On this occasion no bombs were dropped.

Germans as a rule have not much sense of humour, but it was perhaps some idea of joking which made them announce that on Sunday, November 17, their squadrons carried out "nuisance raids" over London the whole day. As a matter of fact, London had only two "Alerts" that day. Raiders do not always escape scot-free, and the fate of one German machine was certainly humiliating. One morning it attacked a paddle-boat minesweeper, H.M.S.

LOOKING BACK: The tail and port engine of a Fiat B.R.20 brought down in the recent Italian daylight raid on the Thames Estuary.

WAR IN THE AIR (CONTINUED)



IONIAN EYRIE : H.M.S. *Eagle* which, with the *Illustrious*, took part in the night action against the Italian fleet in Taranto Harbour. The *Eagle* is one of our oldest carriers. Originally laid down as the Chilean battleship *Almirante Cochrane*, she was redesigned as an aircraft carrier and finally completed in 1924. She is a ship of 22,600 tons with a speed of 24 knots and hangarage for 20 machines. The flight deck is 667ft. long. Main armament consists of nine 6in. and four 4in. guns, in addition to the usual 3-pounders, pom-poms and machine-guns. A war complement of 750 men is carried.

Southsea, which must have looked a fairly easy victim. None the less, that survival of an almost obsolete means of propulsion shot the aircraft down and there were no survivors. H.M.S. *Southsea* was not damaged, and nobody on board was hurt.

On Monday, November 18, three Blenheim fighters of a Coastal Command squadron on North Sea patrol had a most successful encounter with enemy aircraft. One of the enemy was a flying-boat—a Dornier 18—which was quickly destroyed. Another engagement was with two Heinkel 115 seaplanes, and in this case one Blenheim pilot first met the enemy. He was able to divide the Heinkels, and attacked one head on, immediately silencing one of its guns. The pilot came so close to the enemy that he had to break off the combat temporarily to avoid a collision. A few moments later he resumed the attack and pieces began to fall from the Heinkel. It went towards the sea, enveloped in smoke. This Heinkel was most probably destroyed, but cannot be actually claimed. By then, the British pilot had expended all his ammunition on the falling German, and, defenceless, he went into cloud when the second Heinkel appeared to challenge him. At that moment another Blenheim fighter came on the scene, and went straight for the second enemy, bringing him down with a burst of fire from 25 yards range.

British Blows on Germany

DUISBURG-RUHRORT, the largest river port in the world, and vital link between the Rhine and Ruhr, was chosen for the main thrust of the night's offensive by the R.A.F. on November 20. The port is a strategic point of critical importance—the main intermediary in the Ruhr between rail, road and waterway, and the bridgehead of the whole industrial area on the right bank of the Rhine. The coal of the Ruhr is assembled there, and every day hundreds of barges unload iron, oil and grain. So great is the traffic that the port has four railway stations, and many first-class roads lead to it. A serious raid on the port—and Wednesday night's raid was certainly serious—must inevitably have disorganised essential traffic and destroyed indispensable raw materials.

Our bombers arrived soon after 11 o'clock, and for many hours, both from high and low levels, they attacked in waves and showered their high explosives and incendiary bombs on quays, docks and warehouses.

Some especially heavy bombs were used, and the destruction was made more widespread by the use of a large number of lighter high-explosive bombs which are obviously suitable for so extensive a target. The weather favoured the attacks. The night was clear, only a very few pilots mentioned slight ground haze, and all reported that visibility was excellent. How much store the Germans set by this inland port may be judged from the great concentrations of anti-aircraft guns and searchlights which our pilots found there, but the ground defences did not prevent attacks from as low as under 2,000ft.

Weather also favoured accurate observation of results. Our medium bombers were the first to arrive, and these brought back reports of many fires and large explosions. Three of the fires were particularly impressive, and could be seen from far away.

The first of our heavy bombers went in over the target soon after midnight, and at once began to add to the destruction. From then onwards machine after machine arrived with clockwork regularity, and the bombing was almost continuous. In all, this second wave of bombers counted 34 bursts on the target, and reported fires past counting.

One pilot said that when he arrived he at once saw a great fire at the north-east end of the Long basin, and it is thought that one of the many huge warehouses must have been burning. Another crew described an immense explosion fully half an hour after they had made their attack. The pilot of the last aircraft to leave saw six great fires as he turned for home, and another, equally large, blazing among the silos and storehouses beside the port.

The last wave of bombers was over Duisburg-Ruhrort round about five o'clock in the morning. The weather was still good and visibility excellent. Many sticks of bombs were dropped. One was clearly seen to burst on one of the main docks, and two sticks a little more to the west. On another dock a stick resulted in a large explosion, and two or three fires which quickly gathered strength. As the aircraft left, the crew saw a fire burning furiously and with a good hold. In the words of one of the pilots, "I happened to look at Baedeker before we left for Duisburg. He says that a trip round the docks is worth while—we found it so."

When a Heinkel, flying over Kent on November 21, saw three Spitfires in pursuit, the enemy pilot turned and made for cloud. All three R.A.F. pilots were able to get in bursts as the Heinkel raced for safety. The last to attack him was a sergeant-pilot, who came up, overtaking

AIR LOSSES DURING THE WEEK ENDING NOVEMBER 23

	GERMAN Aircraft	BRITISH Fighter Aircraft	BRITISH Pilots
Nov. 17 ...	13	5	1
" 18 ...	2	—	—
" 19 ...	5	—	—
" 20 ...	2	—	—
" 21 ...	1	1	1
" 22 ...	2	—	—
" 23 ...	11 (4 German, 7 Italian)	—	—
	36	6	2

British Bomber losses over enemy territory :—Nov. 19, 3 ; Nov. 20, 1 ; Nov. 22, 1 ; Nov. 23, 2. Total 7.

at high speed, from directly astern. His fellow pilots saw his Spitfire fly straight on into the Heinkel and both aircraft crashed in flames The sergeant-pilot was killed. So were the crew of the Heinkel. Since each of the other two pilots reported receiving return fire from the Heinkel, it is possible that the sergeant-pilot was either killed or severely wounded just before he would normally have broken away.

It was learned later that the machines crashed at Buckland, Kent. Faversham Fire Brigade and auxiliaries went to the scene, and while Second Officer A. T. Beaumont, of the Faversham brigade, was using an extinguisher a bomb exploded and he was killed outright. Leading Fireman C. S. Davey, of Faversham A.F.S., was badly injured and died shortly after admission to Faversham Cottage Hospital.

Air Marshal O. T. Boyd, recently appointed deputy to the Air Officer Commanding-in-Chief, Middle East Command, is a prisoner of war in Italian hands. An Air Ministry announcement on November 21 said that Air Marshal Boyd was reported missing while crossing the Mediterranean by air, and it was later learned that he is a prisoner. He was on his way to take up his new appointment in the Middle East when captured by the Italians. Rome radio stated that Air Marshal Boyd's machine was forced to land in Sicily owing to shortage of petrol. Earlier Italian news bulletins had stated that the machine was forced down by Italian fighters in a field near Roveto, and that the Air Marshal had fired his revolver into its petrol tank before being arrested by local police. The official Italian communiqué announcing the capture said there were seven men in the British machine including the Air Marshal, a Major and three junior officers.

The Italians will doubtless be jubilant at thus capturing a senior British officer.

Their bomber force in France has had another setback. On Saturday, November 23, it attempted another raid on Kent, and very speedily lost seven machines, which were shot down by British fighters. The British losses were nil.

The Fall of Koritza

COMING so soon after the crippling of the Italian fleet at Taranto, the capture of Koritza by the gallant Greeks is a very heavy blow for Signor Mussolini and his Fascists. It appears that the Greek High Command showed masterly strategy, directing all attention to their forces in the North, and making the Italians believe that it was in that sector that the Royal Air Force was giving them most help. Actually the real thrust was made in the South, and when the Italian forces there were decisively driven back, it became necessary for the troops in Koritza to evacuate the town in order to avoid being surrounded. The Italian communiqués have admitted serious losses. The Greek Army has pressed the retreating Italians hard, and Albanian bands of guerillas have risen and are harassing the fugitives. At this moment one wishes that the Anglo-Greek forces could command the services of swarms of bombers to turn the Italian retreat into a rout, as the R.A.F. was able to do in 1918 to the retreating Turks in Palestine and to the Bulgars moving back from the Salonika front. The Greeks have pushed on their cavalry and light tanks, but bombers would be more effective for that sort of work.

However, good use has been made of what bombers were at hand, and Athens has reported that the R.A.F. scored a direct hit on a bridge across the Devoli river while Italian troops were crossing it in their retreat from Koritza. They had themselves mined the bridge, meaning to blow it up when their own troops had crossed, and the British bomb exploded the Italian mines. There were tanks on the bridge and they were blown to pieces. The R.A.F. have also bombed Elbasan.

It is reported that in the final stages of the Greek advance both British and Greek aircraft made effective use of dive-bombing. Armoured cars and a mechanised supply column in the Argyrokastro valley were bombed from a low altitude. The Italian drivers fled into the hills, and Greek cavalry captured many units intact. Horsed cavalry still has its uses.

The Greek successes have been far greater than their friends and well-wishers could have hoped for, but it would be unwise to over-estimate their results. In every way Italy is a more powerful country than Greece, and though she has suffered heavy blows she has not been knocked out. There is, too, the chance that Germany will send her reinforcements in one way or another. All of us Allies may rejoice (and there will certainly be rejoicing in most parts of France), but it is too soon to exult. Perhaps before these words are published new developments will have taken place. But for the time being, Mussolini, who has acted as a braggart and a bully, has been humiliated. All the world has seen his humiliation, and even his partners in the Axis must be sneering at him.

A ROYAL REPUBLICAN : It would appear that, after all, Sweden has taken delivery of some of her American aeroplanes. Here is a Republic Aviation Corporation "Guardsman" of the Royal Swedish Air Force about to make a flight.

A TRICYCLE TRAINER

All-metal "Owlet" Equipped for Night Flying and Blind Flying : Many Features of Successful "Cygnet" Retained

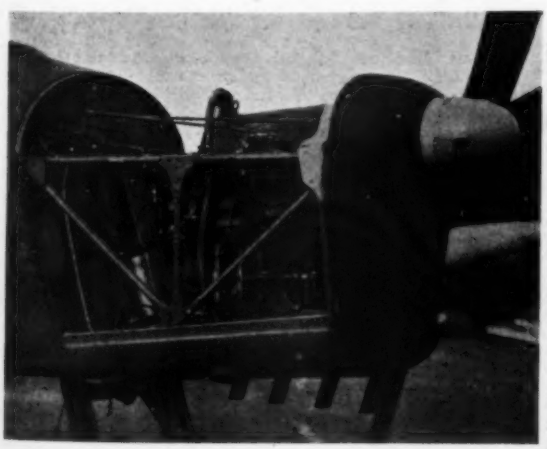
(Illustrated mainly by "Flight" photographs)

ONE of the surprising features of the war is, not that British aircraft export should have dwindled, but that it should exist at all. In spite of all the difficulties arising out of priority claims of materials for military aircraft, of obtaining export licences, and last but not least of finding the time and the men, General Aircraft, Ltd., has persistently pursued the policy that export must, come what may, be kept alive if the country is to remain in a healthy financial condition.

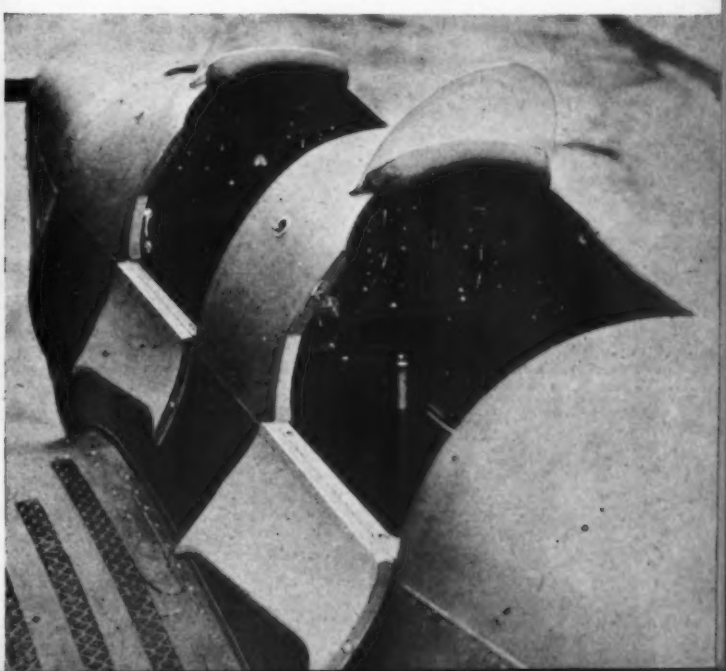
The Cygnet side-by-side two-seater cabin monoplane the manufacture of which the company took over in 1938, has never gone out of production, and recently a Cygnet was sent to South America, where it has created a very favourable impression, not only as an ultra-modern all-metal two-seater, but because it represents a phase of British activity which the friends of Great Britain in Latin America had thought dead for the duration of the war.

Not content with having one type of light aircraft available for export, General Aircraft has, under the energetic directorship of Mr. E. C. Gordon England, designed and built quite recently another two-seater which is suitable not only for export but for work at home. The machine is an all-metal, open-cockpit trainer intended for school work and for specialised training in night flying and blind flying, not to mention training for the large military aeroplanes with tricycle undercarriage which this country has ordered in the United States.

(Continued on page d.)

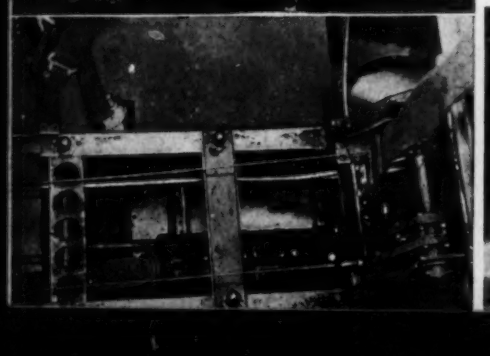


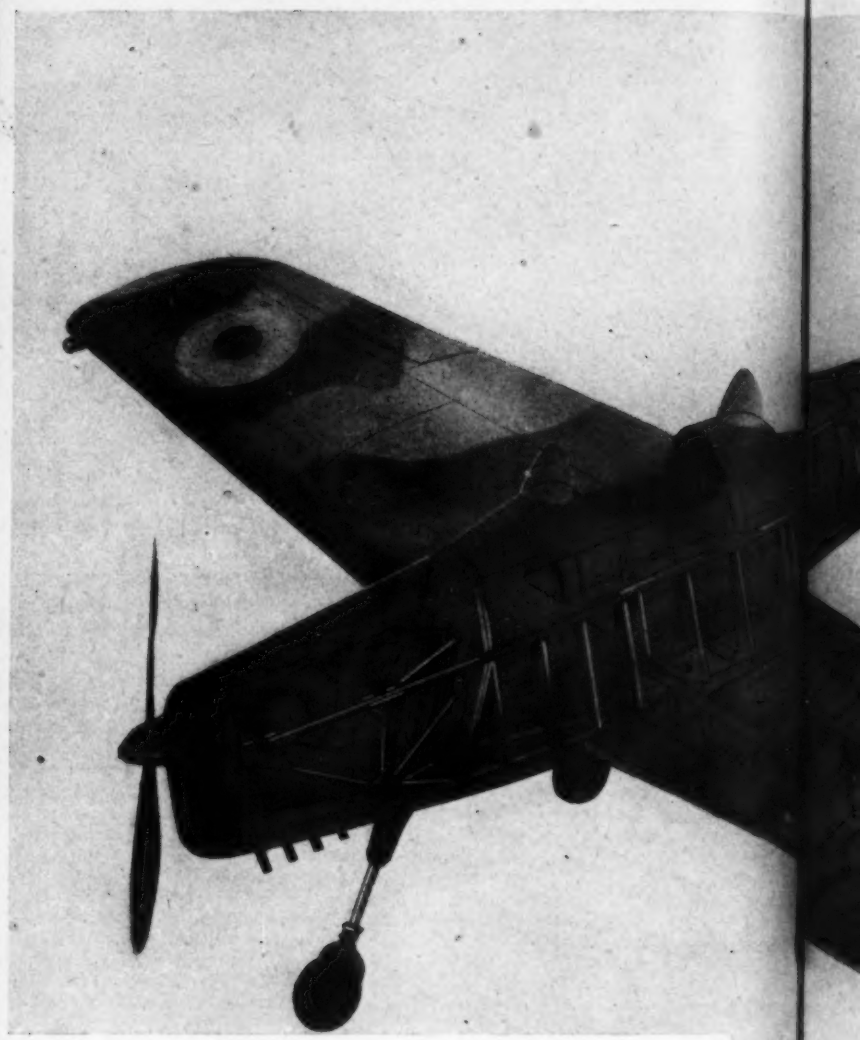
The Cirrus Major engine installation is very accessible when the engine cowling is removed. For inspection the cowling is merely hinged upwards.



The cockpits, showing some of the numerous instruments. Note that the main engine switches are placed on the outside.

C





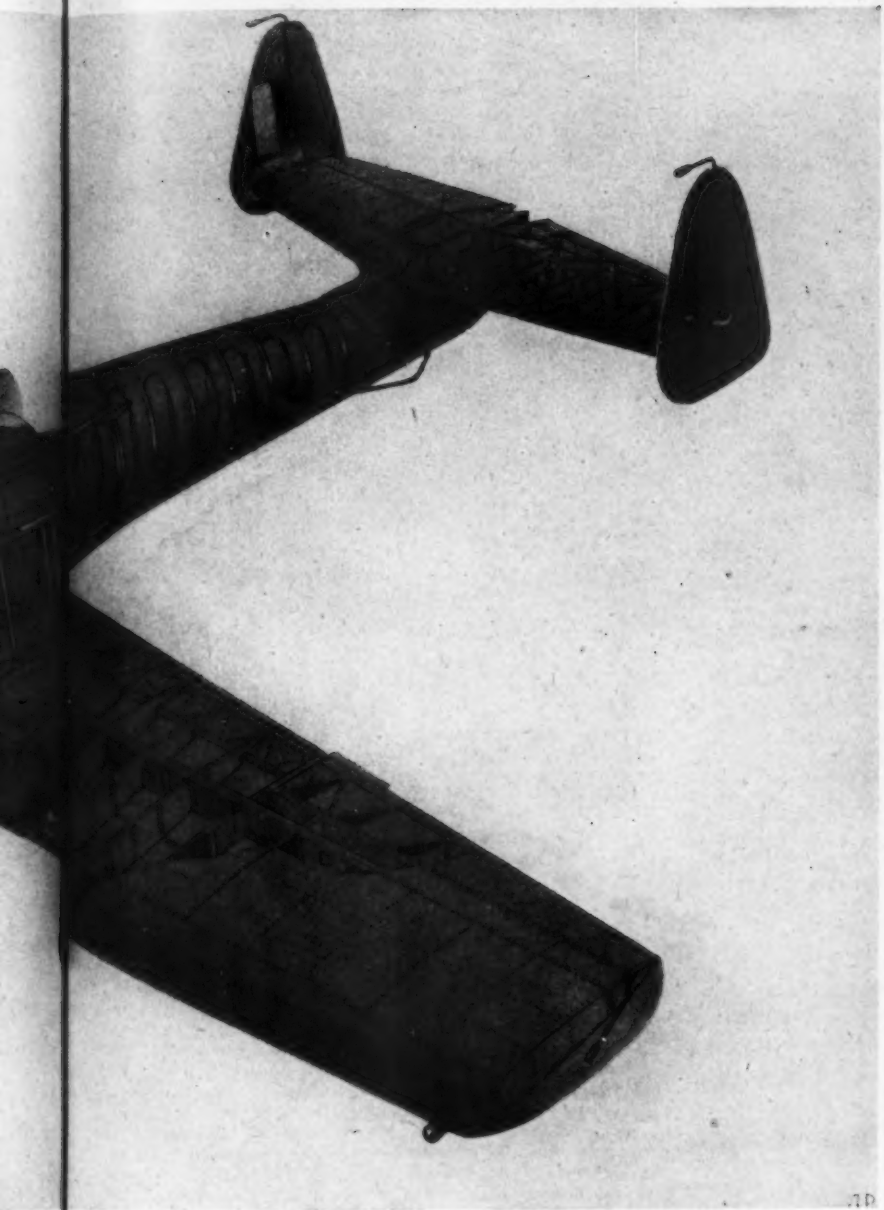
OWLET FEATURES AT A GLANCE

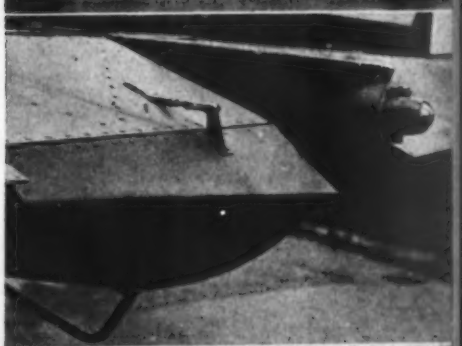
The similarity of the structure of the Owlet to that of the Cygnet is evident in this special *Flight* drawing by "J.P.," which reveals constructional details. Equipment and other features are shown in the surrounding photographs.

Details of the controls and other fittings which indicate careful planning. Reading fro top to bottom we see (1) the front cockpit controls. The upper lever operates the landi light and the three lower levers operate the throttle, altitude control and flaps respectivel (2) Fuel cock in the front cockpit. Note the De Havilland telephone tubes and Petrof piping. (3) Control countershaft arranged at the rear of the aft cockpit. (4) The fire exti guisher, which is located in the front cockpit, can be operated by the foot of the rear occupa

Under side of the pilot's seat (5) showing the recesses for the four ball joints, seen in (6), which the leg length is adjusted.

The views (7 and 8) below show the tail skid and the cantilever step and non-slip walkwa

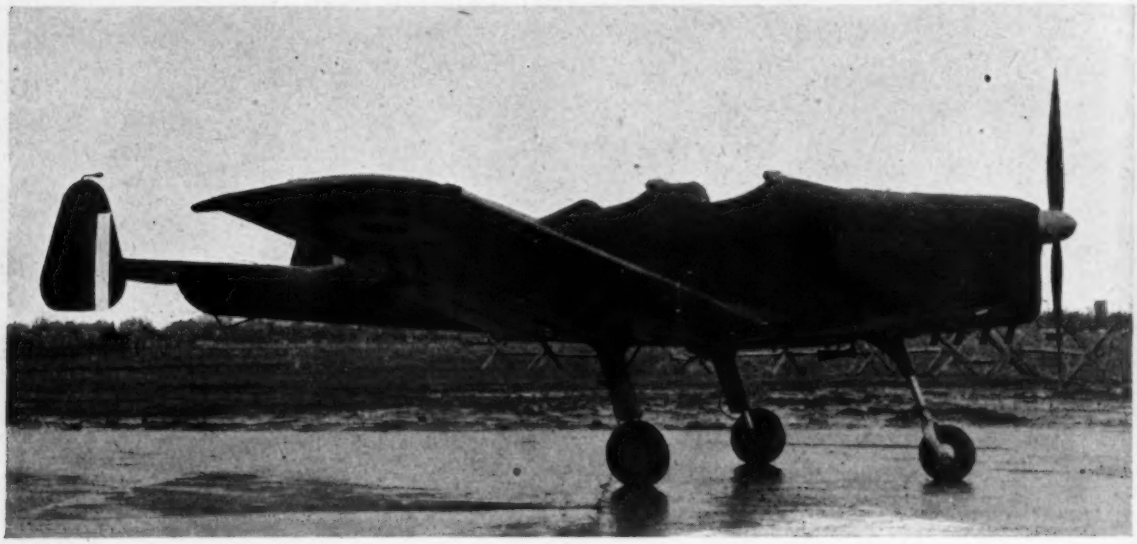




Other features of the new trainer which are of special interest are seen on this page. Reading from top to bottom these are the wind-driven generator (1); the mass balance for the aileron and the pitot head appear next (2), while immediately below this view is seen the mass balance and hinge point for the rudder (3).

The next three illustrations show the navigation lights, the port light (4), the rear light, situated in the pointed stern between the tail trimming tabs (5), and the landing light, which is located in the port wing (6). The two views below (reading to the left) are (7) the fuel sump, under the wing, and (8) one of the rudder cranks. The sump is fed from both tanks and supplies the engine by means of a power-driven pump.

A TRICYCLE TRAINER (CONTINUED)



In spite of the large dihedral angle of the wings, the Owlet is very stable in a cross wind.

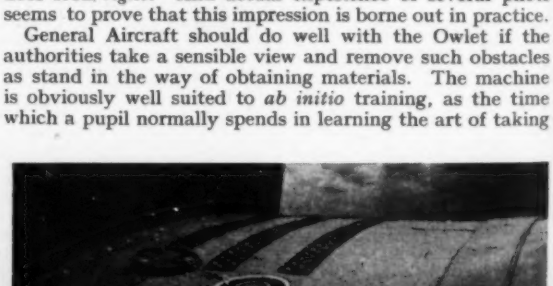
In view of the success of the Cygnet, and because much money has been spent on tooling for its manufacture in numbers, it is not surprising to find that the Owlet, as the new trainer is called, makes use of many of the structural units of the Cygnet, such as wing panels, fuselage portions and so forth. Rather surprisingly, the considerable difference in width of the two fuselages (the Owlet has tandem seating and the Cygnet side-by-side) has not precluded the application of such standardisation on quite a large scale. Many advantages accrue therefrom, including a reduction of cost and a speeding-up of manufacture.

Instant Response

Features which have been found satisfactory in the Cygnet have been retained in the Owlet, and others, desirable in an aircraft intended primarily for training, but not necessarily in one designed to appeal to the private owner, have been added. For example, sensitive controls, giving instant response without jerkiness, are among the particularly noteworthy characteristics of the Owlet; this is agreed by all pilots who have flown the machine. On the occasion of a recent visit by members of *Flight's* staff, the wind was gusting up to 60 m.p.h. or more, and Mr. Charles Hughesdon not only had no difficulty in giving a series of demonstration flights, but gave us a show of aerobatics the "finished" nature of which was scarcely marred by the gusty wind. Needless to say, the take-offs and landings were greatly facilitated by the tricycle undercarriage, the way in which the machine "stayed put" once the wheels had touched being little short of a revelation. It is safe to say that an aeroplane of comparable wing loading and with orthodox undercarriage would have needed a man on each wing tip, if it had been able to go out at all. The Owlet took no notice of the gusts, there was no sign of "ballooning," and the comparatively wide wheel track made cross-wind taxying at high speeds quite practicable, in spite of the fairly pronounced dihedral angle of the wings.

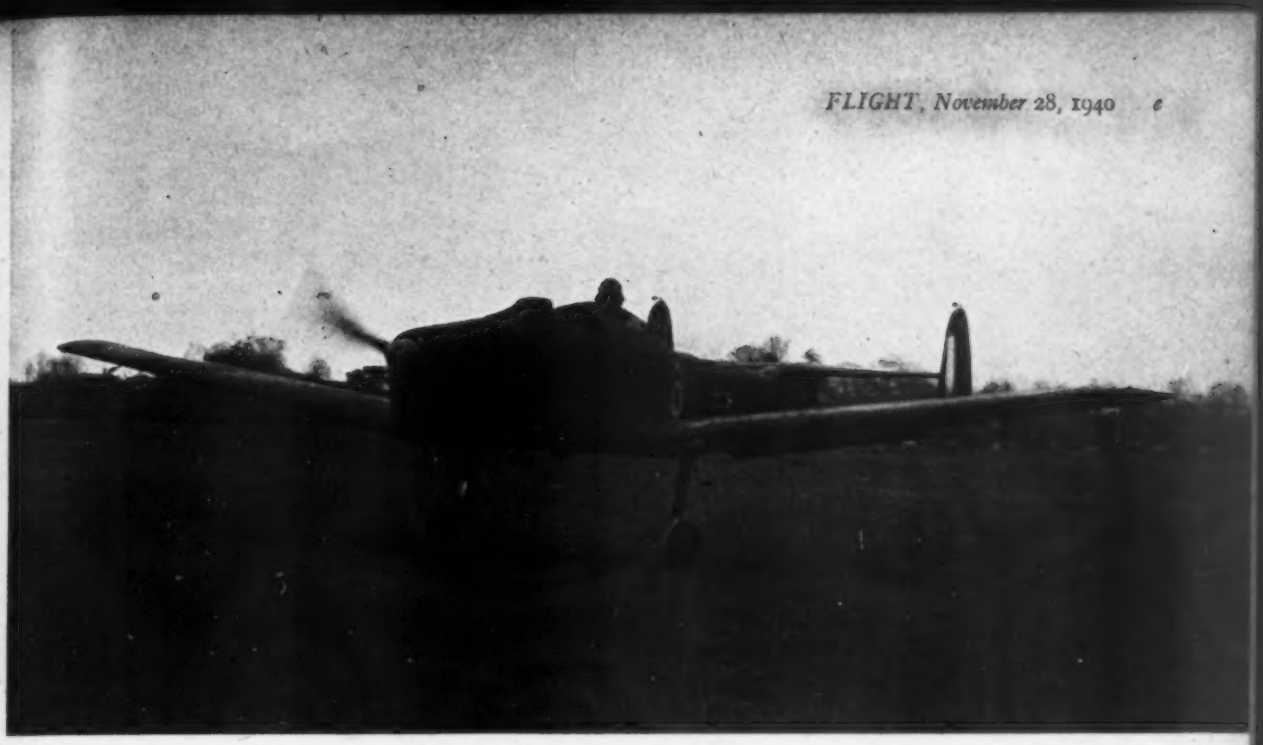
At first the rather "stilty" undercarriage and the twin rudders strike an unusual note, but one soon becomes accustomed to them, and even if that were not the case, a demonstration such as that which we witnessed would very readily convince one of the logic of the design. Perhaps the whole situation may be summed up by saying that although, at first sight, the Owlet does not look pretty, it does look *right*. And actual experience of several pilots seems to prove that this impression is borne out in practice.

General Aircraft should do well with the Owlet if the authorities take a sensible view and remove such obstacles as stand in the way of obtaining materials. The machine is obviously well suited to *ab initio* training, as the time which a pupil normally spends in learning the art of taking



(Above) The fuel and oil filler orifices. Note the streamlined rubber cover.

(Left) The front undercarriage leg and fork and starboard main undercarriage leg showing the brake-operating cable.



Mr. Charles Hughesdon landing the Owlet in a very high wind. Note how all three wheels are "glued to the ground."

off and landing should be very materially reduced, thanks to the three-wheeled undercarriage. Furthermore, it is known that Great Britain has ordered from the United States of America numbers of military aircraft, large and small, bombers and fighters, which have tricycle undercarriages. Conversion courses will have to be given to pilots who have not previously flown aeroplanes so equipped, and the Owlet would seem to be very suitable for the purpose. And it would be good logic and sound sense to look ahead, as Mr. Churchill does, to a long war and to the time when pupils who will be starting training soon will be called upon to fly military three-wheelers. If they start their training on tricycles they will take the more readily to the high-power types which they will ultimately fly.

For "ab initio" Training

It is to be hoped that the Owlet will be carefully considered in connection with the Empire Training Scheme. Obviously arrangements have gone too far to make drastic changes possible, but it would be worth while to order a number for use as "first step" machines. In other words, instead of spending a lot of time on teaching a pupil to make landings, before sending him solo, make the learning of landings easy and get him into the air. Afterwards, when the period of clammy hands is behind him, teach him the two-wheel landing technique last instead of first. In that way the Owlet could be made a valuable addition to, but not a substitute for, the orthodox training types in use at present. On their own initiative General Aircraft are sending an Owlet to India, but that principle ought to be extended—with Government encouragement.

Designed as it is both for *ab initio* flying training and for night flying and blind flying, the Owlet carries a very complete set of instruments and equipment. At the moment the prototype is not fitted with a hood for the pupil, but one is being designed and will complete the usual array of gear. Navigation lights are fitted to wing tips and fuselage stern, and there is a landing light in the leading edge of the centre section, on the port side. On the starboard side is an electric generator driven by a small windmill, so that the electric supply is ensured even in the event of engine failure. A venturi tube for the gyro turn indicator is mounted under the belly of the fuselage, in the path of the warm exhaust gases, where icing is unlikely to occur.

The control surfaces are similar to those of the Cygnet, and the whole tail unit is, in fact, identical and interchangeable with that of the earlier machine. Twin fins and rudders set at the tips of the tailplane reduce the tendency to swing during take-off, and at the same time they act as baffles, thereby increasing the effectiveness of the tail and elevator. Ailerons are of normal type, and trimming tabs are provided, being of the thin sheet metal

The split trailing edge flaps are of all-metal construction. The position of the flap is shown by the indicator in the other picture.

A TRICYCLE TRAINER (CONTINUED)

Getting ready for a flight. Note the long travel of all three oleo-pneumatic legs.

fixed type which is initially adjusted by simple bending and then left alone. The tab on the elevator is under the control of the pilot, the tailplane incidence being fixed. Mass balances are fitted to all control surfaces.

Air brakes show up to special advantage in three-wheeled aircraft, as they can be used without fear of causing the machine to leave the ground again. Those of the Owlet are vacuum operated, the control lever being mounted on the same quadrant as that which carries the throttle, so that the movement of the pilot's left hand from flap control to throttle control is the shortest possible. The flap position is shown by an indicator on the port side. The landing light is dipped by a lever just above the throttle. The engine switches, by the way, are placed on the outside of the cockpit coaming, where their position can be seen by the ground crew without having to climb on to the wing.

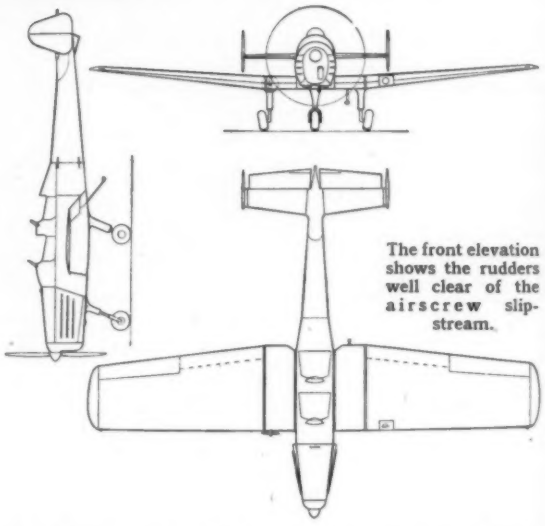
Normal Controls

The flying controls are of orthodox type, the rudder pedals being cranked to give parallel motion. The front wheel is steerable, and is operated by the rudder pedals.

Long travel (approximately 8in.) is provided for the front wheel as well as for the two main wheels. The undercarriage legs are of General Aircraft design and oleo-pneumatic type. They carry Dunlop doughnut wheels fitted with Bendix brakes. The brakes are operated by a handle on the floor, to the left of the seats. The pilot has an overriding control to enable him to release the brakes, should the pupil put them on too hard.

The engine fitted as standard is the Cirrus Major, of 150 b.h.p. It drives a Fairey metal airscrew of 7ft. diameter. A refinement in the fuel system is a streamline sump under the belly of the fuselage. The two tanks in the wing roots (total capacity 26 gallons) feed by gravity to this sump, whence the petrol is forced to the carburettor by an engine-driven pump. This system has been incorporated in order to avoid the formation of air locks. An interesting refinement is a long vent pipe from the oil tank. This runs right to the stern of the fuselage and discharges there.

Seats of the standard service bucket type are used, and their position is adjusted by a simple arrangement of tubular runners.



The front elevation shows the rudders well clear of the airscrew slipstream.

Structurally, the Owlet is, as already mentioned, similar to the Cygnet in most of its main components. The wing is of the two-spar type, with I-section spars built up of a flat sheet web and extruded flanges in R.R.56 alloy riveted to the web. The web is stiffened by drawn sections riveted to one side of the web. The ribs are of simple sheet type, with top and bottom flanges turned over and angle pieces riveted on. The covering is, of course, sheet metal.

The fuselage has a centre portion of open box section, with longerons at the corners. The top coaming is of wood, and can be removed to facilitate inspection of the interior. The tail portion of the fuselage is identical with that of the Cygnet, but is one bay shorter.

Performance, as such, is of no great importance in a trainer, but it may be of interest to point out

The tail of the Owlet is identical with that of the Cygnet, and is interchangeable with it.

A TRICYCLE TRAINER (CONTINUED)

In spite of a blustery wind, Mr. Hughesdon was able, thanks to the very effective controls, to do a banked turn close to the ground.

that the maximum speed of the Owlet at sea-level and 2,450 r.p.m. is 125 m.p.h. The cruising speed at 2,200 r.p.m. is 110 m.p.h. The sea-level rate of climb is quite good for a trainer, being 770 ft./min., and the service ceiling is 15,000ft.

Of very special interest in a trainer aircraft are the take-off and landing runs. The Owlet, with its effective split flaps and its three-wheeled undercarriage, takes off, in a wind of 5 m.p.h. and a temperature of 5 deg. C., in 210 yards. This is with flaps half-way down. The distance to clear the 50-ft. screen is 475 yards.

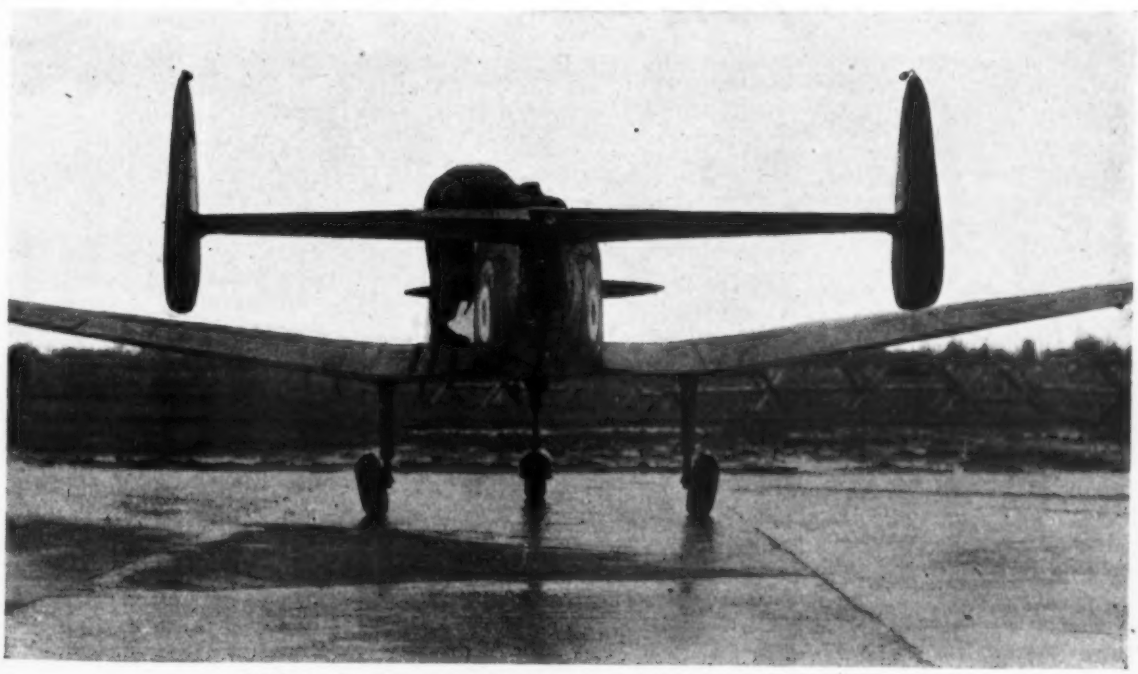
Landing run with wheel brakes "on" and the flaps fully down is only 150 yards. On the day when Mr. Hughesdon demonstrated the machine to us the wind was high, the approach angle was very steep, and the landing run was almost nil. Incidentally, the stalling speed with flaps down is 53 m.p.h. The actual landing or touching-down speed may be as low as 60 m.p.h., but the machine may be put down at speeds up to 80 m.p.h. The undercarriage is designed to stand the loads.

The Owlet is stressed for aerobatics at a loaded weight of 2,000 lb. In the normal category this weight goes up to 2,300 lb.

As weight figures vary according to whether the machine is used as a day trainer or as a night-flying trainer, they are best set out in tabular form.

	Day Trainer (lb.)	Night Trainer (lb.)
Tare weight (including standard equipment)	1,563	1,644
Crew	340	340
Petrol (26 gals.)	200	200
Oil (3 gals.)	27	27
Parachutes	40	40
Allowance for special equipment and luggage	130	49
All-up weight	2,300	2,300

Fishplate joint of rear to main fuselage portion



Tailpiece. The fins and rudders increase the effectiveness of the elevator.

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WARWICK

MEN OF THE MOMENT

New Appointments : Younger Men in Key Posts

SO many new appointments in the R.A.F. and connected with it have been announced lately that we feel sure that our readers will like to learn something of the men concerned. Some of the names are already fairly familiar to the public, but others deserve to be better known. Long biographies are not possible in the available space, but the following brief accounts will do something to lift the veil of the bald official announcements.

The most important of the new appointments is that of **Air Chief Marshal Sir Robert Brooke-Popham, G.C.V.O., K.C.B., C.M.G., D.S.O., A.F.C.,** as Commander-in-Chief of the Far East. Sir Robert is aged 62. He started his career in the Oxford Light Infantry, and when a Captain passed through the Army Staff College. Then he learnt to fly, and in 1911 received R.Ae.C. certificate No. 108. Next year he joined the Air Battalion of the Royal Engineers, and, when this became the Royal Flying Corps, Brooke-Popham was given command of No. 3 Squadron. In the last war he mainly held senior staff appointments, but he was awarded the D.S.O. and received a number of other British and foreign decorations. In 1918 he became Controller of the technical side of aircraft production at the Ministry of Munitions, and for a time he was Director of Research at the Air Ministry. He was the first Commandant of the R.A.F. Staff College when it was formed in 1921, and in 1926 he became the first officer to command the newly formed Fighting Area. In 1928 he was appointed A.O.C. in Iraq, and while there he brought about a friendly meeting between two hereditary enemies, the late King Faisul and King Ibn Saud. Later he was the first Air Force officer to be Commandant of the Imperial Defence College. After the Italian conquest of Abyssinia he resigned from the R.A.F. to become Governor of Kenya, but on the outbreak of war he rejoined his old Service. Few men have had a more varied career, or held more diverse appointments of unique importance.

Air Chief Marshal Sir Robert Brooke-Popham, Commander-in-Chief, Far East.

Air Marshal Sir Arthur Sheridan Barratt, C.B., C.M.G., M.C., has been appointed A.O.C.-in-C. of the new Army Co-operation Command of the Royal Air Force. He was born in India in 1891, and entered the Royal Artillery. He joined the R.F.C. shortly before the last war and was soon sent to France to join No. 3 Squadron. Soon after he did a fine piece of spotting for his old regiment, the R.A., and was granted the Military Cross. After the war he passed through the Army Staff College, and was Commandant of the School of Army Co-operation at Old Sarum—a splendid preparation for his present post. He has also been Commandant of the R.A.F. Staff College. In the present war, while the B.E.F. was still in France, Sir Arthur was made A.O.C.-in-C. the Air Force in France, combining in his command the Air Component of the B.E.F. and the Advanced Air Striking Force. He has a full comprehension of what the Army needs from the air, and no better man could be found to inaugurate the new Command.

The Fighter Command is to be congratulated on getting **Air Marshal W. Sholto Douglas, M.C., D.F.C.,** as its Commander-in-Chief. He is a stout fighting man. In August, 1914, he joined the Special Reserve of the Royal Field Artillery, and later became an observer in No. 2 Squadron, R.F.C. At that time he used to photograph positions with a hand camera pointed through a hole in the bottom of the fuselage. Afterwards he became a pilot in No. 8 Squadron. On one occasion he was sent in a B.E.2c as escort to another machine of the same type which was on reconnaissance, when they were attacked by four Fokkers. The reconnaissance machine was shot down, but Douglas fought his way home in spite of repeated attacks, and one of the Fokkers was apparently damaged by his fire, for it landed. Later he commanded in turn two distinguished squadrons, Nos. 43 and 84. He received the M.C. while commanding the latter, and the citation in the *London Gazette* described him as "a very gallant officer and brilliant leader." No. 84 Squadron had shot down 201 enemy aircraft. In the inter-war years he has served in the Sudan and at home, has passed through the Staff College at Andover, and been an instructor at the Imperial Defence College. He has also won several essay prizes. Last April he was appointed Deputy Chief of the Air Staff.

Deep sympathy is due to **Air Marshal O. T. Boyd, O.B.E., M.C., A.F.C.,** on being taken prisoner by the Italians when on his way to Cairo, where he had been appointed Deputy to Air Chief Marshal Sir Arthur Longmore. He belonged originally to the Indian Cavalry, but in 1916 was seconded to the R.F.C. In the Somme battles he fought gallantly in a Martinsyde Squadron, No. 27, and won the Military Cross. He was in Mesopotamia at the finish of the war. Since the Armistice he has been Commandant of the School of Army Co-operation and an instructor at the Army Staff College, Camberley. He has also commanded the British Forces at Aden, and lately he has done fine work as A.O.C. the Balloon Command.

The new Deputy Chief of the Air Staff is **Air Vice-Marshal A. T. Harris, O.B.E., A.F.C.,** aged 48. He started the last war in the 1st Rhodesia Regiment and served in General Botha's campaigns in South and South-West Africa. He joined the R.F.C. in 1915 and served in France. After the war he served in India and Iraq, and then passed through the Army Staff College. In 1938 he was a member of the Air Ministry mission which visited the United States and Canada. On his return he commanded the R.A.F. in Palestine and Trans-Jordan.

Air Marshal E. L. Gossage, D.S.O., M.C., at the commencement of the present war was A.O.C. No. 11 Group in the Fighter Command, the Group which then

was chiefly responsible for the defence of London. Since then he has been Air Member (of the Air Council) for Personnel, and now he has been placed in charge of the Balloon Command. That sounds to the outsider like a comparatively restful post, but if energy can improve matters in that Command, Air Marshal Gossage is sure to bring about that improvement. Born in 1891, he went up to Cambridge, and then entered the Army through a Special Reserve commission in the Royal Field Artillery. He went to France with his battery in 1914, but next year was seconded to the R.F.C. In the battle of Loos he won the Military Cross for patrol and spotting for the guns. He served in Nos. 6 and 8 Squadrons, and commanded the latter. After the war he was Commandant of the School of Army Co-operation, passed through the Army Staff College, and in 1930 was Air Attaché at Berlin. Later he served in Iraq, and then held the Command at Aden, where he met No. 8 again.

Air Marshal P. Babington, M.C., A.F.C., is aged 46. In 1914 he was an officer in the Hampshire Regiment, but transferred to the R.F.C. and served in France. During the last war he commanded Nos. 46 and 141 Squadrons. Since the last war he has served in the Middle East and has held various appointments at home. Now he becomes Air Member for Personnel at an age much younger than the average of the Air Council, and in time of war it is a good thing to give comparative youth its chance in the higher appointments.

BIG BOMBERS for BRITAIN

THE United States will release 26 four-engined bombers for Great Britain, it has been officially announced recently. Twenty of these will be the Boeing B-17B, the so-called "flying fortress," though, without belittling it in any way, it is less of a flying fortress than our Sunderland is, and its wing span is actually a few feet less. The other 6 are the more recently designed Consolidated B-24s (also known as the Consolidated Model 32), which was illustrated and briefly described on page 145 in our issue of August 22. Both these types are to be exported with the Sperry bomb-sight, but not the more modern Nordern sight, which is still kept secret by the U.S.

The Boeing B-17B has a span of 103ft. and length of 68ft.; its total loaded weight being 37,000 lb. Speed is given as 268 m.p.h. at 14,000ft., and it has four geared Wright GR-1820 engines rated at 1,200 h.p. for take-off. Range is given as 4,200 miles and service ceiling as 29,300ft. This range is the extreme value and is not with full bomb load. The disposable load of the aeroplane is given as 19,327 lb. (8.6 tons).

The Consolidated B-24: Of similar dimensions (its span is 110ft. and length 64ft.), the B-24 is somewhat heavier than the Boeing, weighing fully loaded 40,000 lb. The makers claim over 300 m.p.h., a range of 3,000 miles and a bomb load of 4 tons, but all these may not be fulfilled simultaneously. No detailed performance data, nor the disposal load, have been released yet.

While both these monoplanes are of considerable striking power, they are only the equivalent of others which are being developed in Britain, and the advent of 26 of them will not win the war for us. But they will be very welcome to the Royal Air Force, and less so over Germany. It is stated that three are due for delivery in November, three in December and 20 more before March. It is no secret that some of these machines will be flown across.

"Flight" copyright drawing by "J.P."

IN A HURRY TO GET HOME. Two Junkers Ju. 88 dive-bombers put their noses down slightly on a long slant for their home base. An illustrated description of the Ju. 88 will be published next week.

THE ARMY CO-OP. COMMAND

The Vicious Principle of "Operational Control"

By MAJOR F. A. de V. ROBERTSON, V.D.

THE guiding principle of the new arrangement (announced in the last issue of *Flight*) for supplying the Army with the air support which it needs has been, one may say with some confidence, to avoid the handing over of air squadrons to the complete control of the Army. Of course, it is publicly announced that the Air Staff and the General Staff are in agreement about the new measures. That sort of announcement always has to be made when some new step has been taken after a long period of bargaining and disagreement. Some compromise is reached to which both parties feel obliged to assent because they have despaired of getting any more of their own way and this is proclaimed as hearty agreement. One has known of similar cases before in which the same hearty agreement was publicly proclaimed, whereas in real truth the side which had got what it thought was the worst of the bargain felt very deeply aggrieved. In this case of the Army and the air, it is just possible that the General Staff is actually satisfied with the new arrangement, but if it is not, it is obliged to hold its tongue.

Air Marshal Sir Arthur S. Barratt, who is responsible for close co-operation between air and land services.

There are two ways of settling a difference of opinion between two Government departments. One is for a superior authority, namely, the Cabinet, to lay down a basic principle of what is best for the country, and to decide in accordance with that principle, regardless of how sore the losing department may feel about it. The other way is to let the two departments wrangle it out, each side thinking more about a departmental score than about the higher interests of the country.

Fear of Dissolution

In its dealings with the Admiralty and the War Office during the last twenty odd years the Air Ministry has been obsessed with the fear of losing control over anything which flies. The Ministry is composed of human beings, and their nervousness on this point was a natural human infirmity. In 1918 the two older fighting Services did not welcome the institution of the Royal Air Force as a separate Service. They could not see the necessity for it or the desirability of it. Fighting men are notoriously conservative and hate innovations; they have done so ever since, and even before, the old soldier of mediæval times who declaimed against "villainous saltpetre," which was spoiling the fun of war. Consequently, the Air Ministry lived always with the bogy of dissolution into its original component parts darkly peeping over its shoulder. It was obsessed with the fear that if either of the other Services gained control over any flying units, that would be the thin end of the wedge which would lead to the disintegration of the R.A.F. So the Air Ministry would fight to the death rather than surrender the control of a single squadron. By this time that bogy ought to have melted into thin air.

Looking back, one can now see that the original mistake in 1918 was to absorb everything into the R.A.F. instead of forming the new Force apart from the R.F.C. and R.N.A.S., and leaving them more or less as they were. But nobody thought of that in those days, though the episode of the Independent Air Force showed that there was a glimmering of comprehension of the essential difference between a separate air campaign and air support for the older Services. Consequently, the country's defence system is now slowly and painfully retracing its steps to the point at which it ought to have arrived, but did not arrive, in 1918.

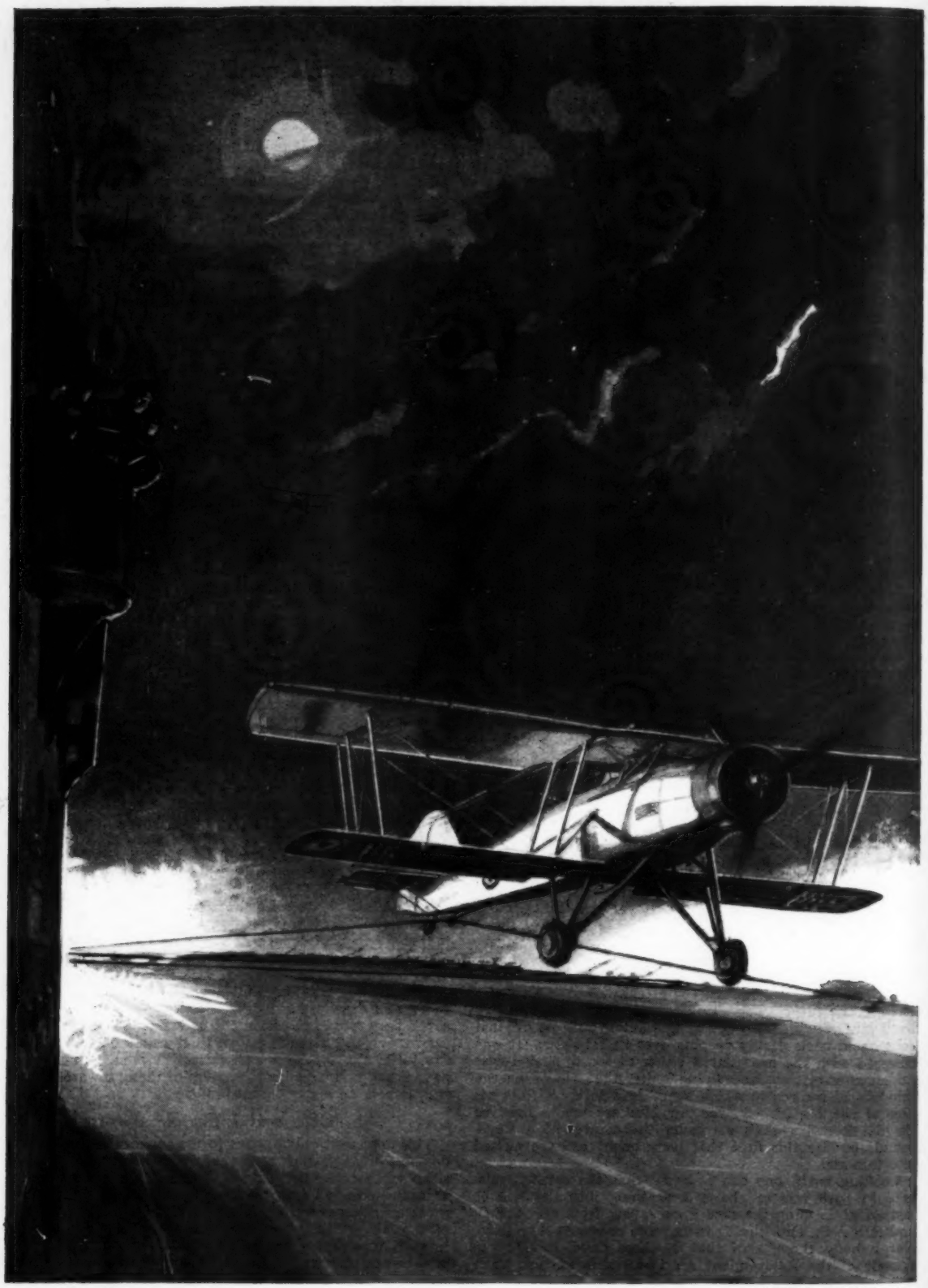
Ultimately we shall get the three Services on to a common-sense basis, and then the safety of the country will be increased, but that time is not yet. For the moment the Air Ministry has carried its point, and has not given up the control, or rather the possession, of the air squadrons which must work with the Army. Short of that, the Air Ministry will do almost anything that is asked of it. It wants the Army to be satisfied, so that the Army shall not make further requests. Sooner than give up the possession of those squadrons, the Air Ministry will even refrain from demanding what it really ought to get, namely, the complete control of the A.A. guns and searchlights.

The great fault in the new compromise is that it perpetuates, for the time being, the vicious principle of giving one Service "operational control" of units raised by and belonging to another Service. That can never be a satisfactory arrangement, though it may be made to work so as to give an appearance of success so long as both parties are determined to make it work. In times of stress, such as war, every right-thinking person is much more concerned with beating the enemy than with considering *amour propre*, and so the danger is less. The War Office, for example, will now put effort into making the A.A. guns and searchlights as good as can be; but there is no guarantee that in times of peace it will not slip back into its old way of treating them as the Cinderella among its various children. In the same way, there is no guarantee that the Air Ministry, once the war is won, will not treat the Army Co-operation Command as having less claim on its resources than has, say, the Bomber Command. In time of peace, budgets are apt to grow skimpy, and it is then that the favoured child gets the breast of the chicken, while Cinderella must be content with the drumsticks. Again we have painful memories of the A.A. guns at the time of the Munich humiliation. In all probability the Air Ministry, with its chronic fear of losing squadrons, may exert itself even in peace time to keep the War Office content, but that is not a sound principle on which to organise the defence of the country. Each Ministry and Service ought to be wholly responsible for all the corps, squadrons, batteries, or what not, which it needs for doing its regular day-by-day work. "Operational control" can never be a good substitute for complete possession. The Service which gives the orders to the unit when in action should be the Service which raises the men, trains them, pays them, and pays for them, equips them, rewards them, and (when necessary) punishes them.

Flexible and Inflexible Forces

This argument only applies to the squadrons which must do the everyday work of the Army. There must be occasions when other Commands of the Air Force will have to come with full force to the help of the Army, as they must on other occasions come with full force to the help of the Navy. It is essential that the Bomber Command in particular should be flexible; that is one of the reasons why we must have an Air Force. But certain squadrons must be specially trained, as the Lysander squadrons now are, for work with the Army, work which will be of no use to anybody but the Army, and those squadrons ought to be raised by the Army and be manned by soldiers.

AFTER A SECOND COPENHAGEN



"Flight" copyright drawing.

A vivid impression by Max Millar of the jubilant "landing-on" of the Fleet Air Arm Swordfishes from their night torpedo attack on the Italian fleet at Taranto. In 1801 Napoleon wanted the help of the Danish fleet to invade Britain; Nelson destroyed it. In 1940 Hitler needs the Italian navy; the Fleet Air Arm has incapacitated half its capital ships at one blow.

Air Strategy—XXIX

ITALY as a TARGET

A Mussolini Story : Island Strategy : A Safety Zone

By CAPTAIN NORMAN MACMILLAN, M.C., A.F.C.

I WAS sorry when the leaders of the Italian people declared war on Britain and France on June 10, 1940. For I have always liked the Italians I have met. They had a quality of "understanding" about them; in the way they expressed their thoughts, in the way they engaged in conversation. True, they did not have quite the quality which the Spaniards so aptly describe as *muy simpatico*—that is, a quality which transcends race and creed and is a garment of personality given only to the few—but they were intentionally charming, their mannerisms the obverse of the mannerisms which make the nationals of some other nations appear to be deliberately rude.

And the humour of the Italian is so different from that of the German. It is rather like our own. I remember one Italian saying to me, "Have you heard this one?"

It was a story about Mussolini. They liked telling stories about Mussolini. They would say, with a deprecatory wave of the hand, "Of course, Mussolini, he have done a lot of good for Italy. The Italians need a man like Mussolini. For you it is different." Then came a subtle national compliment. "You British have more character than the average Italian. The Italian, he is soft by comparison. Lazy. Yes, that's the word. Temperamentally, the Italian, he is lazy mans.

"But all the same, Italian peoples they must laugh. And we always like a joke about Mussolini, even if we think he is fine man. In a way, it is a compliment to him, don't you think?

The Strong Man

"This is the story. Mussolini, he was motoring up in the mountains when his motor car ran off the road and overtorned. Mussolini was trapped underneath, and calls for help. Up comes big country man, strong, with great muscles. With one heave he lifts the car and out comes Mussolini. Instantly the country man recognises him. Of course, who wouldn't? Mussolini, everyones knows what he look like. Well, Mussolini looks at the precipice over which he has just not fallen to his death, and then he torns to the man who has rescued him from terrible ending.

"'You have done a great thing for Italy,' says Mussolini to the man. 'You have saved the life of Il Duce. Ask me what you want and it shall be yours. I make it a presents to you. Land. House. Money. What you like. I—Il Duce—shall give you what you ask.'

"The man hesitated.

"'Don't be 'fraid,' says Mussolini. 'You have save my life.'

"'Excellency,' hesitates the man——

"'Speak,' says Mussolini. 'You will not ask too much for the great thing you have done.'

"'It is not that, Excellency,' say the man.

"'What is it, then?'

"'I ask you just one thing, Excellency.'

"'Whatever it is, it shall be yours.'

"The man he hesitate a little more and then he speak suddenly.

"'I ask only one thing, Excellency. Don't tell anyone I saved your life.'"

There is an opportunity for a Minister of Propaganda to invent funny stories about Mussolini and set the Italian people whispering them and laughing. After all, if one laughs enough at him, a dictator becomes a comedian. The Italian love of humour offers a target which ought not to be missed. Stories could be dropped by our aeroplanes all over Italy. They might do more good than the (presumably) serious documents we showered on Germany during the "phoney war days."

Four years ago, in the Air Ministry in Rome, I met General Valle (then the Italian Under-Secretary of State for Air; Mussolini is the Secretary of State). He said he thought there was a similarity in the geographical configuration of Britain and Italy. He said that the long peninsular shape of Italy made her virtually an island. Now that is a significant outlook. If it meant anything, it meant that General Valle believed that the strategy of air attack which might be applied against Great Britain could be applied also against Italy with as great a chance of achieving success, if one took cognisance of geographical features alone.

The Air Arm

Let it be remembered that at that time the Italo-Abyssinian war was over, Haile Selassie was in Palestine, and the Italian "heroes" were returning from a twentieth-century Roman conquest. Pilots and crews of the *Regia Aeronautica* who had been engaged in the Abyssinian campaign had done wonders against a foe unarmed in the air.

In August, 1935, I wrote in a daily paper: "If Italy engages in military operations against Abyssinia, the air arm will be demonstrated for the first time on a large scale as the predominant factor in military operations. . . Although Abyssinia is a country equal in size to France and Germany combined, by the employment of the new weapon of the air Italy can bring her military operations to a swift conclusion. . . . Air war will defeat Abyssinia."

Because I described how Italy was likely to use her air arm I was reviled by writers of anonymous letters. Two months later the war began. In January, 1936, *Truth* wrote that "Events have rather badly falsified this cocksure prediction . . ." (meaning mine). Two months later the war was over. It was those who did not know how the air arm was developing who had blundered.

War Lessons

And what has happened since? Norway captured in less than two months. Holland captured in four days. Belgium captured in eighteen days. France requesting an Armistice in thirty-eight days after the initial attack. Britain saved from assault by invading forces principally by the efforts of Royal Air Force bombers directed against the German concentration ports. (I have not forgotten the Navy. But it must be remembered that the enemy attack forces never left their ports. What the Navy would have done to them in open water is another matter.)

The effect of the air arm in the fighting of recent wars has been mainly to reduce the duration of hostilities, in every case where one side had a preponderating air strength, and where the conditions made the air arm a powerful strategic weapon. Thus, it is reasonable to assume, from the lessons which recent war history have

made apparent, two things. A nation without superior air strength will be defeated in war. When serious inferiority in air strength is associated with a weak strategic situation, defeat will be rapid. Let us remember these two postulates in relation to Italy.

But, first, permit me to state a prerogative which has been presented to Britain by Italy's own action. It has been said in answer to a question in Parliament that note has been taken of the Italian claim that Italian aircraft have participated in the bombing of London, and that the British Government, therefore, reserves full liberty of action as a consequence of that act of the Italians.

But that is only one case upon which our right of action may be based. Haile Selassie is our ally. The *Regia Aeronautica* gave us a precedent in their use of aircraft in the Abyssinian campaign. One of the younger Mussolinis wrote a book about it. He described how he was thrilled to see his bombs drop among a crowd of Abyssinians when, in the resulting explosion, they "opened out like a beautiful flower." Later, on film work, he went to Hollywood, where he was boycotted for that book.

The present foreign minister of Italy, Ciano, who married Edda, daughter of Mussolini (it used to be said that it was Edda who told the Duce what to do in policy), was also flying in Abyssinia. Italy, against a country whose temporarily absent ruler is our ally, was the first and, so far, only nation to use the aeroplane to discharge poison gas. And Italy did so against tribesmen with no defence against either aeroplane or gas.

Britain need *claim* no liberty of action. Italy forfeited all right to considered reservation of action by the deeds of the *Regia Aeronautica* five years ago. Of one thing I am sure. If any nation now engaged in war dares to use poison gas from the air, Britain will not be first to do so.

Italy, by her actions of five years ago, apart from participating in the bombing of London in recent weeks, gave Britain the right to claim that Italy's Government had committed sufficient outlawry in the air to be dealt with as bandits instead of under the normal usages of war.

There are no basic international rules of conduct for air war. It is the one arm of the Services for which no international conventions have been established. But there is a convention prohibiting all use of poison gas. How much value is placed upon the sincerity of signatories is displayed by the anti-gas equipment of all armed forces of civilised (*sic*) nations.

ITALY AS A TARGET (CONTINUED)

An Island

Now, to return to the basis of comparison raised by General Valle: Britain is a true geographical island; Italy is not. Yet, strategically, Italy must be considered as an island to-day, and that even more pronouncedly so than when General Valle made the comparison, for these reasons.

The seizure of Albania in 1939 created a double bridgehead for the Italians at the mouth of the Adriatic; the collapse of France in June, 1940, cut out the military frontier abutment on the north-west; the alliance with Germany removed (after the annexation of Austria in March, 1938) the main difficult military frontier-abutment in the north-east; Switzerland and Yugo-Slavia are at present neutralised.

So far as Britain is concerned, Italy is to-day, strategically, an island, far more an island than the Italian Under-Secretary of State can have contemplated in 1936. But those words must mean that Italian military chiefs believe that Italy is peculiarly susceptible to the pressure of blockade. Long-range aircraft have increased that susceptibility, in spite of the naval safeguards which Italy has taken to protect herself.

Just as Germany is the target heart of our combined enemies, the mainland of Italy is the target heart of the nether end of the Axis. Therefore Italy should be subjected to the most rigorous form of air blockade which it is possible to devise.

Air Blockade

And it is because of the necessity to do this, and because of the certainty that it will be done, that I said at the beginning of this article that I am sorry that the Italian people, whom I like, had been led into war against us by their leaders. When they begin to feel the increasing power of Britain's air blockade I hope they will remember that the British were their friends until Mussolini let us down.

For the purpose of considering the application of air blockade against Italy, it is desirable to divide the mainland of Italy into three. These three parts are: (1) the territory north of the line Genoa, Venice, Trieste and including Italy's territory on the eastern side of the north of the Adriatic; (2) central Italy south of the line Genoa-Venice and north of the line Ostia-Rome-Pescara; (3) the mainland south of the line Ostia-Rome-Pescara and including Albania and Sicily.

So far the Royal Air Force bombers have dealt chiefly

with industrial targets in the Northern Sector of Italy, and more recently, since the attack upon Greece, with naval targets in the Southern Sector. The Central Sector has been free from attack; it was within this Central Sector that Hitler met Mussolini at Florence a short time ago; possibly that meeting place was decided upon out of consideration for its situation in a safe area.

But with British aircraft able to operate from aerodromes in Greece, Florence need no longer be considered safe. Florence is the same distance from the nearest part of the English coast as is Danzig, and Danzig was raided for the first time on the night of November 10-11, 1940, by British bombers based in Britain. Athens to Florence is only fifty miles farther, and there are aerodromes in Greece which can bring British bombers fifty miles nearer Florence than they are on the British coastline.

Admittedly, the percentage of Royal Air Force aircraft able to raid that distance away must still be relatively small. But if the aircraft of the Royal Air Force are applied to blockade targets on a range basis the most efficient use can be made of the bombers of all types which we possess, and that is the only satisfactory way to deal with the systematic air blockade of Italy.

Until Italy began her adventure against Greece it was impossible to blockade Italy effectively either by sea or air or both; the result was that Italy felt only the cramping of a partial blockade. Now here is a golden opportunity to tighten the air blockade so that Italy will really begin to feel the combined power of the Royal Air Force and the British Navy.

With the new bases for air operations which Mussolini has so kindly presented to the Royal Air Force on Greek soil, the process of dealing with Italy in air operations becomes relatively simple. As a target Italy is far more easily hit than is Germany.

In the Northern Sector there are eight points of railway entry into Italy. In the Central Sector there are three main north and south railway lines; three principal junctions cut these lines completely. In the Southern Sector there are only two principal longitudinal railway lines, which can be cut at three principal junctions.

In all three Sectors all ports are within range to-day. Thus it is possible to deal the most damaging blows at the whole rail and sea communications of Italy and throw her back on to the roads. That at once brings to the forefront the question of fuel for road transport, a serious factor in Italian war economy. With the vital railway and seaports cut off it would be impossible to bring in any large supplies of fuel for road transport from abroad, and Italy's whole communication system could be brought into a state of complete confusion.

Just as the principal target in Germany for the air blockaders is the industrial capacity of the German Reich, so is the principal target in Italy the arterial railway communications and the sea-borne trading power.

These are the two targets against which the Royal Air Force blockade ought to be directed, and at which they should hammer relentlessly with all the power at their disposal. Other targets there are, but these two are the most important. So, before Germany sends powerful help to Italy against Greece, let us get ahead with the smashing up from the air of Italian internal transportation, while still maintaining our air blockade of Germany.

CO-ORDINATION of PRODUCTION

The Work of the London and South Eastern Area Board

THE production of materials for the three fighting forces and the wartime needs of the civilians—nearly all of whom are fighting also—is a matter of vital importance to Britain. In peacetime our factories grew up in locations and of such size and with such equipment as was required by the needs of that time. To convert this peacetime arrangement into an efficient wartime system calls for extensive rearrangement—a factory may be able to make all of a hand grenade except one part; if its potential productive capacity is to be utilised it must be provided with the machine tools to make that last part, or some other factory must be set the task of making the part in just the numbers required. For to make it in greater numbers would only be waste and would not result in any more grenades being turned out.

Other problems are: suitable premises have to be found for an expanded staff, groups of small firms amalgamated in order to achieve greater efficiency, temporary premises found for a bombed factory while its building is rendered useful again—in short, the problems cover premises, labour, equipment, raw materials and transport.

To deal with these problems Boards are being set up at various centres. The London and South Eastern Area Board has its headquarters at Brettenham House, Lancaster Place, W.C.2 (telephone: Temple Bar 9591), and has nine clearing centres to which factory executives are invited to bring their troubles relating to production.

The Board is so constituted that the members sitting on it are those who are concerned with the various problems which arise. From the Admiralty, Ministry of Aircraft Production and Ministry of Supply come one representative each, while the Trade Union Council and the employers have three representatives each. A divisional controller of the Ministry of Labour is there for consultation on labour questions, and a Board of Trade man for export matters. There is also an officer to perform liaison duties with the Industrial Capacity Committee, to which body the Area Boards (twelve are being set up throughout the country) are responsible. This Committee reports to Mr. Arthur Greenwood as a Member of the War Cabinet.

In order to give greatest effect to its efforts the Board invites the fullest response from employers and workers and suggests that they communicate with the nine clearing centres when faced with any difficulty. It is the responsibility of the centres to deal with the detailed work and to render active assistance in the national war effort.

For the use of all factories engaged on aircraft, aircraft accessory or other manufacture related to the war, the addresses of the clearing centres of the London and South Eastern Area Board are set out below:

District	Address and Officer in Charge.
Central ..	.. Room 29, Romney House, Marsham St., S.W.1. Franklin 2211, Ext. 2680 (L. Pellat).
No. 1 ..	.. Equitable House, George St., Croydon, Surrey. Croydon 3046 (R. E. Allfrey).
No. 2 ..	.. 60a, High St., Acton, W.3. Acorn 5984 (B. H. Auld).
No. 3 ..	.. 15, College Rd., Harrow. Harrow 4586 (J. B. Taunton).
No. 4 ..	.. 198, Fore St., Edmonton, N.18. Tottenham 3220. (F. W. Churchard).
No. 5 ..	.. Rooms 15 and 23, Cranbrook House, Cranbrook Rd., Ilford, Essex. Ilford 1386 (L. J. Sargeant).
No. 6 ..	.. 20, Court Rd., Eltham, S.E.9. Eltham 5449 (C. J. Phillips). Temporary Address: Dartford Iron Works, Dartford, Kent (Dartford 3456).
Rochester	.. c/o Winget Ltd., Rochester, Kent. Strood 7276. (L. N. Whiteley).
Sussex ..	.. Clayton Priory, Hassocks, Sussex. Bolney 342 (C. L. Sainty).

HERE and THERE

Air Transport Examiner

WHAT must be the most important case concerned with the regulation of air transport, the application of American Export Airlines for the right to compete with Pan American on the Atlantic route, was decided in favour of American Export a few months ago, as was reported in *Flight*. The case was heard before the chief of the Board's proceedings division, C. Edward Leasure, who has the rare qualifications of both engineering and legal training.

A graduate in civil engineering, he then took a course to obtain his degree in law. Most of his professional life has been devoted to the examination of the economic side of engineering transport activities, a type of work for which his training must fit him admirably. After being with the Southern Railway and Capital Traction Co., he became a valuation engineer in the Interstate Commerce Commission. Joining the Civil Aeronautics Board in 1938, he has handled the hearings of many of the Board's cases concerned with rates of payment for air mail services and others dealing with regulation of competition.

Canadian Aircraft Manufacture

BY mid-October 645 aeroplanes of various types had been made available for Canadian use, it was announced by Mr. C. D. Howe, Munitions and Supply Minister. Of this number 272 had been built in Canada, 176 had been assembled in Canada, 138 had been assembled by the Royal Canadian Air Force, and 59 had been delivered from United States factories. A $3,000,000 plant extension programme was announced underway at the same time to provide for the growing production of aircraft used in the British Commonwealth Air Training Plan, while two new plants costing $2,500,000 were being planned for the construction and overhaul of aircraft. Canadian factories had received orders from the Canadian Government alone in the previous three months amounting to $35,000,000. Negotiations have been completed for the production in Canada of many items formerly unobtainable in the Dominion, including areoplane tyres, electrical equipment, pyrotechnics, bomb sights and aircraft parts.

Douglas Going Underground?

IT is reported that the Douglas Company is planning the construction of a factory which will be invisible both at night and during the daytime from the air and from the ground. All parts of it will be below ground and air-conditioned. There will be bomb-proof shelters (it is hoped that this means literally "bomb-proof" and not merely air-raid shelters which open to admit the first small bomb arriving, of which too many have been seen in this country). Oil and petrol will be stored underground and the car park will be connected with the factory by concealed passages.

(Might it not be a good idea to put the car-park underground, too? Any searching bomber which drops a parachute flare and sees long rows of parked cars has an immediate clue that the invisible factory is not far away. It might make good use of the opportunity.)

Railway Air Services

RAILWAY AIR SERVICES introduced a new winter time-table on November 11. This provides a service each way every weekday between Glasgow and Belfast and Liverpool and Belfast. Freight traffic for conveyance on these routes will be accepted at any railway station. Until their suspension by a general Government order at the outbreak of the war, Railway Air Services had been continuously operated since August, 1934. But, even when their public services were temporarily suspended, their machines were voluntarily placed at the disposal of the Air Ministry for communication flying. Public air transport was eventually resumed by the company in May of this year.

Rearmament in U.S.A.

DURING the first half of October the U.S. War Department awarded contracts to the value of $450,479,766 for aircraft and engines for American use. These contracts were distributed as follows:—

	$
Douglas Aircraft Co., California: Aircraft	141,320,610
Glenn L. Martin Co., Maryland: 1,100 B-26 bombers	99,641,880
North American Aviation Inc., Cal.: Aircraft	72,857,049
Curtiss-Wright Corp., Buffalo, N.Y.: Aircraft	48,514,819
Curtiss-Wright Corp., St. Louis, Mo.: Aircraft	45,646,882
North American Aviation Inc., Cal.: Aircraft	37,770,982
Continental Motors Corp., Mich.: Engines	4,727,543

Bombs from Canada

CANADA is to produce 500-pound aerial bombs, starting in February, according to Munitions Minister Howe. The plant located in Quebec province will have a normal annual output of 100,000 bombs. The long range programme includes all sizes of bombs from 40 pounds to 1,000 pounds and from the ordinary H.E. bomb to the aerial projectile capable of piercing heavy armour plate. Aerial bombs have not previously been made in Canada.

Production of Piper Cubs

IT has been announced by the Piper Aircraft Corporation that during the first nine months of 1940 this company manufactured over 2,000 Cubs, a record which they claim has never before been equalled by any manufacturer of aircraft. W. T. Piper, president of the Corporation, predicted that 3,100 Cubs would be made for the entire year of 1940. Present rate of production is averaging 100 Cubs per week, but this figure will soon be materially increased when two new assembly buildings are in use.

Training in Canada

OF the 83 training schools required for the British Commonwealth Air Training Plan, 48 will be in full operation by the end of 1940, according to Air Minister Power. About 5,000 are in training, he stated, in mid-October, and the R.C.A.F. has 17,000 applicants waiting for enlistment. The training schedule has been speeded up, with the pilot's course reduced by 2 weeks to 23 weeks. A 40 per cent. increase in number of men being trained has been announced.

CYGNETS IN BRAZIL. Prospects of orders are good since General Aircraft sent a Cygnet to Brazil, where it has created an excellent impression. South Americans are particularly pleased to find that, in spite of the war, England can still export aircraft. The colour scheme is light blue and cream. In the seat is Mr. E. C. Gordon England, managing director of General Aircraft.

SERVICE AVIATION

Royal Air Force and Fleet Air Arm News and Announcements

R.A.F. Commander in Greece

AIR COMMODORE JOHN HENRY D'ALBIAC, D.S.O., is in command of the British forces in Greece, with units of R.A.F. squadrons and of ancillary units for maintenance of the British Army under his control. He is one of the younger air officers, and has had a most distinguished career, having served in all three British Services, the Navy, Army and Air Force.

Born at Kew, Surrey, in 1894, he was educated at Framlingham College, Suffolk. On the outbreak of war in 1914, he enlisted in the Middlesex Regiment, was later granted a commission in the Royal Marine Artillery, and then was seconded to the Royal Naval Air Service. As an air observer, he carried out a series of dangerous reconnaissance flights off the Belgian coast, and in 1915 he was awarded the D.S.O.

In 1918 Air Commodore D'Albiac completed the course at the Imperial Defence College, and is a graduate of the Royal Air Force Staff College. He has seen service in India, Egypt, Transjordan and Palestine as well as in Great Britain, and commanded R.A.F. units in Palestine before being given the command of the British Forces in Greece.

Fire Leaves

IN a broadcast, Mr. D. R. Pye, Director of Scientific Research, Ministry of Aircraft Production, told his audience that the incendiary leaf was partly due to a suggestion made to him by a private inventor. Thousands of these leaves can be carried by a single machine in addition to its normal bomb load. They have been used with considerable effect over Germany during the dry weather of last summer.

Awards

THE KING has been graciously pleased to approve the following awards in recognition of gallantry displayed in flying operations against the enemy:—

COMPANION OF THE DISTINGUISHED SERVICE ORDER.

SQN. LDR. A. A. MCKELLAR, D.F.C.—A.A.F., No. 605 (COUNTY OF WARWICK) SQUADRON.—Since killed in action. This officer has led his squadron with outstanding courage and determination. He has destroyed twenty enemy aircraft, and his magnificent fighting spirit has proved an excellent inspiration to his fellow pilots.

BAR TO THE DISTINGUISHED FLYING CROSS.

ACT. FLT. LT. C. F. CURRANT, D.F.C., No. 605 Squadron.—Since September, 1940, this officer has personally destroyed six enemy aircraft and damaged several others, bringing his total to thirteen. He has led his flight, and on occasions his squadron, with great success, and shows a sound knowledge of tactics against the enemy.

P/O. H. M. STEPHEN, D.F.C., R.A.F.V.R., No. 74 Squadron.—One day in October, 1940, this officer was on patrol with his squadron when enemy fighters were sighted and attacked. P/O. Stephen fought four Messerschmitt 109s at 29,000 feet, causing the tail of one to break off, and destroying a second. He has destroyed at least 13 enemy aircraft, and his courage and skill as a fighter pilot have been a great incentive to other pilots in his squadron.

P/O. R. F. T. DOE, D.F.C.—No. 238 SQN.—This officer has continued to engage the enemy with initiative and success. On one occasion he dived vertically through a strong protective formation of fighters and attacked two four-engined enemy aircraft. He has destroyed a total of fourteen hostile aircraft.

BAR TO THE DISTINGUISHED FLYING MEDAL.

SGT. J. H. LACEY, D.F.M.—R.A.F.V.R., No. 501 (COUNTY OF GLOUCESTER) SQN.—Sgt. Lacey has shown consistent efficiency and great courage. He has led his section on many occasions, and his splendid qualities as a fighter pilot have enabled him to destroy at least nineteen enemy aircraft.

DISTINGUISHED FLYING CROSS.

FLT. LT. P. CORBISHLEY.—In November, 1940, this officer successfully completed a special mission involving a hazardous flight of 5 hours 20 minutes at a height of 27,000 feet in a 120 m.p.h. wind. He has completed thirty similar missions and can always be relied upon to successfully execute any duty ordered.

ACT. FLT. LT. J. C. MUNGO-PARK, No. 74 Squadron.—In October, 1940, this officer was on patrol with his squadron at 30,000 feet when a formation of enemy aircraft were sighted. Flt. Lt. Mungo-Park attacked a Messerschmitt 109 but had to break off the engagement as his windscreen became iced up. He cleaned this and again attacked the enemy aircraft and caused it to crash into the sea. He has personally destroyed eight hostile aircraft and has at all times displayed great courage and coolness in action.

F/O. J. N. MACKENZIE, No. 41 Squadron.—F/O. Mackenzie has flown with his squadron since the war began and has on numerous occasions led his squadron. He took part in the intensive air fighting covering the Dunkirk operations, and has since led his section with conspicuous success. Since Sept. 6, 1940, this officer has destroyed at least seven enemy aircraft and has at all times shown skill, courage and determination in pressing home his attacks against superior numbers of the enemy.

P/O. B. G. STAPLETON, No. 603 Squadron.—P/O. Stapleton has flown with his squadron in active operations since the war began. He has personally destroyed at least six enemy aircraft and has shared in the destruction of two others. P/O. Stapleton has displayed great skill and courage in the face of superior numbers of the enemy.

ACT. SQN. LDR. M. L. ROBINSON.—No. 609 WEST RIDING SQN.—Squadron Leader Robinson has shown conspicuous gallantry and leadership in his attacks against the enemy. On two days, in combat with large enemy forces, he destroyed two of their aircraft on each occasion, bringing his total victories to at least six.

FLT. LT. C. J. MOUNT.—No. 602 CITY OF GLASGOW SQN.—This officer has shown outstanding ability as a leader. One day in October, 1940, he led his Squadron against the enemy with outstanding success when eight of their aircraft were destroyed without loss. Flight Lieutenant Mount has himself destroyed two and damaged a further three enemy aircraft.

ACT. FLT. LT. R. H. HOLLAND.—No. 92 SQN.—This officer has been continuously engaged in active operations since October, 1939. He has shown outstanding skill in leading his section, flight and squadron, and his keenness to engage the enemy on all occasions has proved a splendid example. He has destroyed at least six enemy aircraft and damaged a considerable number of others.

ACT. FLT. LT. A. D. J. LOVELL.—No. 41 SQN.—This officer has flown continuously on active operations against the enemy since war began. He has shown a fine fighting spirit and has led his flight, and on occasions his squadron, with great courage, coolness and determination. He has destroyed seven enemy aircraft.

F/O. T. P. M. COOPER-SLIPPER.—No. 605 (COUNTY OF WARWICK) SQN.—F/O. Cooper-Slipper has displayed great skill and daring in air combat. On one occasion he deliberately rammed and destroyed a hostile aircraft after his own controls had been practically shot away. He has destroyed seven enemy aircraft and damaged three others.

P/O. G. H. RUSSELL.—No. 236 SQN.—Early in November, 1940, P/O. Russell was engaged on a reconnaissance of Brest. Despite a box barrage of about 600 bursts and intense light anti-aircraft fire which caused him to descend to twenty feet over the harbour, he succeeded in obtaining valuable information regarding the disposition of ships in the harbour and enemy aircraft on the aerodrome at Brest-Guilers. On the return flight he attacked a Dornier 24 flying boat which was destroyed after a short engagement. He has consistently shown great dash and initiative, and his example has been an inspiration to his fellow pilots.

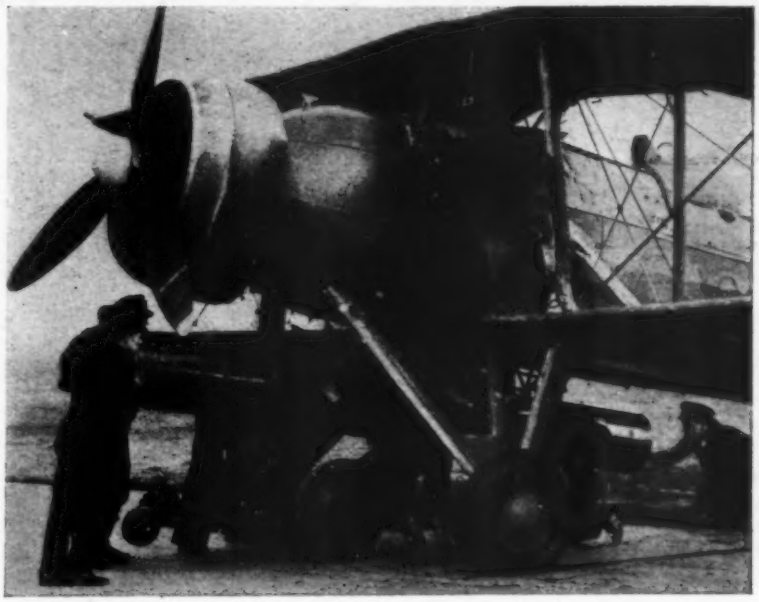
P/O. J. R. URWIN-MANN.—No. 238 SQN.—This officer has displayed initiative and dash in his many engagements against the enemy. He has led his section in an excellent manner and has destroyed at least eight enemy aircraft.

DISTINGUISHED FLYING MEDAL.

SGT. R. H. FOKES, R.A.F.V.R., No. 92 Squadron.—In October, 1940, this airman was on patrol with his squadron at 30,000 feet when a formation of more than twenty Messerschmitt 109s was sighted. Sgt. Fokes attacked one, and followed it down to the ground where it crashed. He has displayed great courage and tenacity and has personally destroyed at least six enemy aircraft.

SGT. M. C. B. BODDINGTON, R.A.F.V.R.—No. 234 SQN.—This airman has participated in nearly every operational patrol carried out by his squadron. He has displayed great determination, coolness and courage, and has destroyed six hostile aircraft.

SGT. E. W. WRIGHT, R.A.F.V.R.—No. 605 (COUNTY OF WARWICK) SQN.—This airman has displayed fine qualities of leadership, skill and



HULKS FOR HULLS: A parachute mine being fitted in the torpedo crutch of a Fairey Swordfish ready for the night's mine-laying operations.

GREEK COMMAND: Air Commodore J. H. D'Albiac, who has been given command of all the British Forces in Greece.

THREE HUNDRED M.P.H. PLUS: A rear view of the Douglas Boston (late D.B.7) now coming into service with the R.A.F. in considerable numbers.

courage. His sound tactics and efficiency have enabled him to destroy at least six enemy aircraft.

Prisoners of War

NEXT-OF-KIN, if able to identify the men from the information published, are requested to advise the Casualty Branches of the Services concerned, forwarding regimental or any other details.

The following is the latest list of British prisoners of war received from enemy sources:—

Sgt. R. E. Phillips, Lawn House, Balford by Nelson.
Sgt. F. A. O'Malley, Fivemiletown, Co. Tyrone.
F/O. D. B. H. McCardie, Tarryaris Park, Carmarthenshire.
Sgt. D. I. Anthony, Cadogan Vale, Rhondda.
Sgt. K. N. V. Townsend, Dorridge, nr. Birmingham.
Sgt. J. A. D. Wright, 5, Mildenhall Road, Birmingham.
Sqn. Ldr. F. G. L. Smith, Lough, Lincolnshire.
F/O. H. F. Byrne, Spring Garden Road, Halifax, Nova Scotia.
Sgt. E. A. Brown, 11, Pembroke Street, London.
Sgt. J. A. Potter, 26, Park Road, Wallasey.

DOCKED: This Hurricane travelled 36 miles back to its aerodrome in this condition. Presumably rudder control was a trifle coarse.

ALERT BUT NOT ALARMED: Fighter pilots wearing tin hats and Mae Wests at an operational aerodrome.

SERVICE AVIATION (CONTINUED)

London Gazette

Royal Air Force

General Duties Branch.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation:—Flight Sergeants: (June 16, Sen. May 25) A. P. Culverwell. (Substituted for notification in the *Gazette* of July 16); (Oct. 17, Sen. Sept. 18) H. C. Morris; (Oct. 29, Sen. Oct. 4) J. G. Lingard; (Nov. 1, Sen. Oct. 23) R. B. Bagguley. Sergeants: (June 5) J. L. Piercey; (June 22, Sen. May 2) A. L. Law; (Aug. 2, Sen. April 25) G. D. Edwards; (Aug. 8, Sen. Aug. 7) W. M. Protheroe; (Sept. 25, Sen. Sept. 11) A. V. Clowes; (Oct. 22, Sen. Oct. 16) C. F. Whitfield; (Oct. 26, Sen. Oct. 24) G. Davison, J. W. Potter; (Oct. 29, Sen. Oct. 16) K. E. Spence.

P/O. on probation R. Gray is confirmed in his appointment (Oct. 31).

The undermentioned are confirmed in their appointments and promoted to the rank of Flying Officers:—Pilot Officers on probation: (Sept. 3) J. Stokes; (Sept. 27) A. E. Dale, D.F.M.; (Oct. 8) P. L. Chilton; (Oct. 21) R. A. L. Morant.

The undermentioned Flying Officers are promoted to the rank of Flight Lieutenant:—(May 28) K. C. Doran, D.F.C.; (June 18) M. C. Wells; (June 19) C. D. Milne; (Aug. 25) T. E. Syms; (Sept. 3) C. A. R. Crews, H. N. Fowler, G. E. Grey-Smith, A. C. Maclachlan, A. J. Hudson, A. J. Madge, F. W. S. Keighley, J. B. J. Boardman, T. K. Milne, N. G. Birks, J. R. Bendell, T. H. T. Forshaw, R. S. C. Wood, B. S. Ambrose, A. L. G. Hubbard, D.F.C., A. R. Gibbes, D.F.C., J. W. E. Leighton, A. H. Simmonds, J. R. Cree, R. Langbear, J. B. Coward, M. R. Atkinson, G. P. Gibson, D.F.C., L. V. E. Atkinson, D.F.C., C. A. Baskett, D.F.C., F. L. H. Eddison, R. J. McConnell, N. K. Loyd, P. L. B. Morgan, C. D. Palmer, T. Preston, G. O. L. Bird, D.F.C., M. L. Watson, H. G. Malcolm, D. G. Stanley, A. M. G. Lywood, H. A. H. Watts, W. S. Barton, D.F.C., L. H. Schwind, A. McL. Lyall, M. T. Kirkwood, P. A. Nicholas, W. P. Bain, H. D. H. Cooper, D.F.C., W. D. Corr, D.F.C., E. V. Hulbert, D. D. Pryde, D.F.C., A. H. C. Cox, P. J. R. Kitchin, R. Sawrey-Cookson, C. E. Bowen, C. S. P. Russell, D.F.C., A. C. H. Haines, L. J. Fry, D. W. Edmonds, R. E. Drake, H. Ledger, D. King, W. J. Carr, W. S. Bowyer, E. G. Le Dieu; (Sept. 13) H. R. Powell (ret.), F. C. Jenner (ret.); (Sept. 15) R. C. Higgins (ret.); (Sept. 21) B. Statham; (Oct. 1) P. H. Way, W. G. Joy, R. P. Elliott; (Oct. 5) J. R. Appleton, D. F. Beardon, J. A. A. Read, F. E. W. Birchfield; (Oct. 8) J. F. Ritchie, V. Viatkin, T. E. Sanders, G. K. F. Garrad, E. G. Scott, A. F. Sunderland-Cooper; (Oct. 15) R. G. G. English, A. P. Philipsen, R. N. Chudleigh, E. D. Griffiths, R. N. Collins, B. G. F. Drinkwater.

The undermentioned Pilot Officers are promoted to the rank of Flying Officer:—(Sept. 21, 1939)

SERVICE AVIATION (CONTINUED)

A. B. Thompson; (June 12) A. W. Matthews; (Aug. 17) I. A. McIntosh, R. J. B. Renison; (Sept. 3) A. M. Imrie, D. E. T. Osment, W. Bunting, W. S. Munday, J. C. Mackintosh, W. J. Thompson, J. H. Frampton, W. N. C. Salmond, D. E. Bond, P. C. Joel, B. L. Watkin; (Sept. 23) R. G. Egerton; (Sept. 30) R. M. Rogers, B. A. H. Hitchings, J. D. Robertson, I. F. McDermott; (Oct. 2) P. M. Proctor, E. N. Baker, J. D. True, J. R. Bellerby, J. R. Thompson, G. R. T. Williams, J. S. Booth, D.F.C., D. M. Wellings, J. Harrison Broadley; (Oct. 21) H. P. M. Edridge, K. D. Small, T. J. Warner, V. F. B. Pike, A. W. Millson; (Oct. 23) C. F. Gray, D.F.C., P. S. Charles, P. J. Simpson, F. H. Craig; (Oct. 25) H. B. Skyrme; (Nov. 6) E. M. Child-Villiers, P. G. Evans, W. G. Spencer, A. R. H. Hayter, G. R. Avery, G. W. S. Ritchie.

Air Vice-Marshal Owen Tudor Boyd, C.B., O.B.E., M.C., A.F.C., is granted the acting rank of Air Marshal (Nov. 8).

Sqn. Ldr. A. C. G. Wimbush (Capt. R. Tank R.) relinquishes his temporary commission on return to Army duty (Oct. 21).

The commission of P/O. on probation G. N. Hutchence is terminated on cessation of duty (Nov. 1).

The short service commission of Act. P/O. on probation N. E. Berrington-Pickett is terminated on cessation of duty (Apr. 26).

The notifications concerning the undermentioned Pilot Officers in the Gazette of Nov. 12 are cancelled:—F. R. Bullot, P. J. B. Griffiths, R. Garside, A. E. Johnson.

Technical Branch.

The undermentioned are granted commissions for the duration of hostilities. As Flying Officers on probation. Warrant Officers: (May 29, Sen. March 14) F. MacK. Pape, D.F.M.; (Oct. 30, Sen. Oct. 21) C. G. Wareham, A.F.M.; (Nov. 6, Sen. March 14) B. W. Carter. As Pilot Officers on probation:—Warrant Officers: (Oct. 19) J. D. Murphy, W. E. Parrish; (Oct. 30, Sen. Oct. 22) E. J. Irish. Flight Sergeants: (Nov. 6, Sen. May 16) R. E. Penwarn; (Nov. 6, Sen. May 30) S. J. E. Easton.

The undermentioned Flying Officers on probation are confirmed in their appointments:—(July 27) C. Herbert; (Aug. 22) E. S. Gentry; (Sept. 4) E. F. Hawkins; (Oct. 17) W. R. Hardeman.

Act. P/O. on probation C. L. Gould is graded as Pilot Officer on probation (Aug. 7).

Administrative and Special Duties Branch.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation:—Warrant Officer: (Oct. 30, Sen. Oct. 15) A. H. Kemsley. Flight Sergeant: (Oct. 28, Sen. Oct. 14) T. Pearson. Sergeants: (Oct. 30, Sen. Oct. 14) W. P. Scott; (Oct. 25, Sen. April 25) F. E. Ratcliffe.

P/O. on probation J. W. Teller is promoted to the rank of F/O. on probation (Oct. 6).

Equipment Branch.

The undermentioned Pilot Officers on probation are confirmed in their appointments (Aug. 17), and promoted to the rank of Flying Officer on dates stated:—(Sept. 29) R. M. Hall; (Oct. 19) D. C. A. Howden, W. A. W. Reid; (Nov. 9) D. F. St. J. Pigott.

Accountant Branch.

The undermentioned Pilot Officers on probation are confirmed in their appointments, July 29, and promoted to the rank of Flying Officer:—(Sept. 13) R. T. Humphreys; (Sept. 14) G. H. Pears, D. R. Yeoman.

P/O. W. Muckleroy is promoted to the rank of Flying Officer (Sept. 13).

F/O. B. T. Proctor (since promoted) relinquishes the acting rank of Flight Lieutenant (June 3).

Medical Branch.

Flt. Lt. F. H. Peterson, M.D., M.C.P. & S. is promoted to the rank of Squadron Leader (Nov. 5).

Royal Air Force Reserve

RESERVE OF AIR FORCE OFFICERS.

General Duties Branch.

Flt. Lt. G. L. Shipton is granted the rank of Squadron Leader (Sept. 21).

The undermentioned Flying Officers are promoted to the rank of Flight Lieutenant:—(Sept. 3) W. R. Parkhouse, W. C. Pitts; (Sept. 5) F. A. Harte; (Sept. 10) R. Hood; (Sept. 18) F. G. Ferrier; (Sept. 25) M. N. Mavrogordato; (Oct. 5) J. H. Van; (Oct. 14) W. W. Briscoe, H. L. Warren; (Nov. 6) F. H. Peers, J. Blackburn, A. G. Parnall; (Nov. 13) W. J. Alington, G. A. Pickett.

Sqn. Ldr. G. L. Shipton relinquishes his commission in class CC on appointment to a commission in the R.A.F.V.R. (Nov. 8).

Administrative and Special Duties Branch.

F/O. A. M. McKenzie resigns his commission (Sept. 1).

Royal Air Force Volunteer Reserve

General Duties Branch.

The undermentioned are granted commissions for the duration of hostilities. As Flying Officers: (Nov. 1) E. B. Green, S. R. Millard, J. P. Saul. As Pilot Officers on probation: (Oct. 23) H. A. Taylor; (Oct. 30) D. G. Duval. Sergeants: (Aug. 22, Sen. Aug. 19) J. B. Collins; (Oct. 5, Sen. Sept. 18) G. C. Toye; (Oct. 6) D. R. Stubbs; (Oct. 12, Sen. Oct. 9) R. A. Marks; (Oct. 16, Sen. Oct. 14) J. F. Hayes; (Oct. 17, Sen. Sept. 18) G. Jones; (Oct. 19) G. F. Chipperfield, L. F. Ratcliff, G. R. Scorer, J. C. L. Ruck-Keene, J. F. T. Ogilvie, R. McC. Carrapiett; (Oct. 20, Sen. Oct. 19) P. W. Norbury; (Oct. 27, Sen. Aug. 26) R. W. Hilken; (Oct. 29, Sen. Oct. 23) H. H. Kitchener, D.F.M., G. S. Milligan, R. T. Stokes; (Nov. 1, Sen. Oct. 23) D. A. B. Ross; (Nov. 4, Sen. Oct. 29) D. M. Cowley. Act. Sergeant: (Nov. 2, Sen. Oct. 23) G. Collis. Leading Aircraftmen: (Oct. 6) H. I. Wetherell; (Oct. 19) R. J. Powell, R. E. S. Smith, I. O. M. Smith, F. N. Crane, A. Gibbons, F. J. Joshua, J. Rhodes, A. V. Smith, W. I. Dalgliesh, D. R. F. Haviland, H. Heaton, C. R. Ashby, R. A. P. Bruce, F. E. Bryant, E. R. P. S. Cooper, G. R. Cooper, J. S. Curl, D. B. Falconer, A. A. Law, C. E. S. Patterson, R. C. L. Reade, F. Rendall, L. K. Smith, J. G. N. Braithwaite, H. D. R. L. Campbell, W. I. Deas, J. D. Gould, G. D. Kerr, A. L. Parsons, S. Hartley, E. T. Laverack, C. Anekstein, C. Carmichael, D. H. Villiers, P. J. N. Adshead, S. H. Birtles, A. J. Cook, J. E. Makgill, E. L. E. Nicholson, R. N. Philpott, R. E. Sears, K. O. Blunden, C. S. Ronsbach; (Oct. 20 Sen. Oct. 19) M. Forbes, E. James; (Oct. 20) H. A. L. Stone, M. A. Thorne, G. Troup, D. Bellerby, A. Bilbe-Robinson, H. McCosh, A. F. Pennymore, R. C. Rendle, R. S. Cavendish, N. St. John-Spencer, J. A. Basham, D. J. W. Cruickshank, P. P. O. Serle, R. J. W. Williams, G. K. Birch, R. W. Dawson, P. H. I. Jones, S. McNeill, H. E. Wood; (Oct. 21, Sen. Oct. 19) K. L. Davies, F. B. Pollitt; (Nov 4, Sen. Oct. 29) N. G. Baxter, F. de B. Collenette, D. O. Cunliffe, P. Delorme.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation:—Sergeants: (July 20, Sen. July 11) A. C. W. Holland, R. T. Turton; (July 27, Sen. July 21) D. H. Gage, A. K. Gatward, D. McL. Gray, C. Merrick, J. H. Rowden, B. M. Thompson; (Aug. 10, Sen. Aug. 4) H. R. Case, D. C. L. Chidell, D. Custerson, J. S. Fifield, M. G. Geoghegan, P. S. James, F. G. Malim, H. J. W. Meakin, P. D. Pool, R. S. Radley, R. J. Roake, D. H. Skinner, R. H. Thomas, J. Wotherspoon. Act. Corporal: (Aug. 11) D. Martin. Leading Aircraftmen: (July 28) P. H. Telford; (Aug. 10, sen. Aug. 4) R. H. McGowan, W. McRobbie.

The undermentioned Pilot Officers on probation are confirmed in their appointments:—(Oct. 5) T. H. Worth; (Oct. 16) G. C. Halley; (Oct. 31) R. Gray.

The undermentioned Pilot Officers on probation are confirmed in their appointments and promoted to the rank of Flying Officer:—(Sept. 18) J. D. Randall; (Sept. 19) L. Swan; (Sept. 26) R. W. G. Holdsworth, P. F. Miles, M. O. Wetzmann; (Oct. 3) D. G. Blennie, R. H. Hillary, A. A. N. Nicholson, R. B. Orborn, P. D. S. Scott-Malden; (Oct. 11) W. Sterne; (Oct. 14) H. H. C. Holderness; (Oct. 19) S. N. Giroux; (Oct. 26) J. H. Thompson; (Oct. 28) H. P. Aiken.

The undermentioned Flying Officers are promoted to the rank of Flight Lieutenant:—(Sept. 3) E. F. Rhodes, F. H. Hawes, H. J. Greenland, C. M. Wight-Boycott; (Sept. 11) S. L. Dodwell; (Sept. 18) H. N. Edge; (Oct. 19) F. J. A. Chase; (Nov. 13) S. P. Jackson.

The undermentioned Pilot Officers are promoted to the rank of Flying Officer:—(Sept. 4) I. R. Batchelor, D. E. Davies; (Sept. 5) V. R. H. Fergusson, K. I. Geddes; (Sept. 9) A. N. C. Weir, D.F.C.; (Sept. 10) G. M. Merrifield; (Sept. 25) W. J. Bourne, A. F. A. Osborn, D. K. Redford, H. C. Black; (Oct. 3) F. C. D. Winser; (Oct. 11) K. G. Burt.

P/O. on probation F. W. Seed, D.F.C., is transferred to the Administrative and Special Duties Branch (Nov. 12).

The commission of P/O. on probation J. F. H. Larden is terminated on cessation of duty (Oct. 11).

Technical Branch.

Cpl. R. A. Butterworth is granted a commission for the duration of hostilities as Pilot Officer on probation (Oct. 28, Sen. Sept. 5).

The undermentioned Pilot Officers on probation are confirmed in their appointments:—(Sept. 9) R. G. Goodfellow; (Sept. 28) R. S. Page; (Sept. 29) J. C. Martin; (Oct. 2) N. Best, W. D. A. Smith; (Oct. 19) V. Bowman-Burns, G. G. Livesey.

P/O. on probation A. F. Allen is confirmed in his appointment and promoted to the rank of Flying Officer (Nov. 16).

Balloon Branch.

The undermentioned are granted commissions for the duration of hostilities as Pilot Officers on probation:—Sergeant: (Oct. 30, Sen. Oct. 3) H. Paterson; (Corporals: (July 3, Sen. June 25) L. L. Sayce; (July 25, Sen. June 25) C. T. W. Hill; (Oct. 22, Sen. Oct. 7) G. W. C. Lake; (Oct. 24, Sen. Oct. 8) G. A. Allen; (Oct. 24, Sen. Sept. 16) H. W. Tucker); (Oct. 29, Sen. Oct. 11) R. M. J. Adams, E. P. Smith; (Oct. 23, Sen. Sept. 27) J. B. Todd; (Oct. 31, Sen. Sept. 27) W. L. Stewart, W. W. Toothill, W. S. Wardle; Leading Aircraftmen: (July 3, Sen. June 25) J. E. W. Arthur; (Oct. 26, Sen. Sept. 30) J. H. Gates; Aircraftmen 1st Class: (July 3, Sen. June 25) L. H. Darby; (July 23, Sen. July 18) J. Swinburne; (Oct. 24, Sen. Oct. 8) S. H. C. Hardy; Aircraftmen 2nd Class: (July 3, Sen. June 25) P. L. A. Brown-Greaves, J. H. Harris. As Act. Pilot Officer on probation:—Acting Corporal: (Oct. 21, Sen. Sept. 30) H. G. Johnston.

BIT OF BRITISH BLITZ: Pilots of a Hurricane squadron who shot down an assortment of seven Italian aircraft in as many minutes during a raid on one of our North Sea convoys. The flight lieutenant leading the formation shot down one Italian and, having run out of ammunition, rammed another.

BEFORE THE MAST UP ALOFT: Rating pilots of the Fleet Air Arm at a Royal Naval Air Station in the south of England

SERVICE AVIATION (CONTINUED)

P/O. on probation W. V. Trubshawe is confirmed in his appointment (Sept. 16), and promoted to the rank of Flying Officer (Sept. 23).

P/O. J. W. Buchanan on probation is confirmed in his appointment and promoted to the rank of Flying Officer (Oct. 28).

Administrative and Special Duties Branch.

Major G. L. Shipton, S.U.L.I.A. (87092) is granted a commission as Flight Lieutenant (Nov. 8).

The undermentioned are granted commissions for the duration of hostilities:—As Flying Officers on probation:—(Oct. 2) E. C. Smith; (Oct. 3) W. McMenemy, M. A. Menier, L. G. Patmore; (Oct. 4) R. V. Watts; (Oct. 21) A. I. Bray; (Oct. 22) I. F. Newman. As Pilot Officers on probation:—(May 11) N. K. Dyson, S. Fletcher, C. L. Goodacre, H. E. Hammond, J. F. Holman, A. MacLeod, M. R. Mandviwalla, P. G. Randell, C. E. Wellings; (June 18) C. F. C. Wilson; (June 27) F. Arnold; (June 29) O. James, J. Orrell; (July 2) E. R. B. Drummond, J. Warham (substituted for notification of Sept. 13); (July 12) G. F. Fenwick; (July 18) W. Browning; (July 19) P. C. T. Dewar; (July 20) H. T. Molloy, D.S.O. (substituted for notification of Sept. 13); (July 24) F. P. St. Maur (substituted for notification of Aug. 27); (July 26) F. A. Waller; (July 27) R. V. Palmer; (Aug 1) J. C. E. Roberts; (Aug. 5) J. H. Bartlett; (Aug. 24) A. R. Reeve; (Aug. 26) E. W. Rogers; (Sept. 6) V. N. Bailey; Sept. 7) J. L. McI. Oliphant; (Sept. 12) H. R. J. Williams; (Sept. 14) O. Drew; (Sept. 20) J. S. Mason, A. K. C. Morley; (Sept. 27) R. W Carley, J. Jackson, F. Jepson, H. K. King, G. W. Pickin, C. E. Pring, J. B. Schofield, J. A. Stephenson; (Oct. 1) E. E. Harris, F. V. Pattern; (Oct. 2) A. K. Maley, J. L. Whitbread; (Oct. 3) J. S. Beatson, H. A. Thomson, A. F. Thorpe; (Oct. 4) C. R. Jeffries, G. G. Precious, N. B Weatherstone; (Oct. 5) E. A. McClintock; (Oct. 7) A. F. Buick; (Oct. 9) A. W. Colley, J. G. Shackleton; (Oct. 10) C. N. A. B. Mumby, G. Shaw; (Oct. 11) Sir S. J. Bull, Bt., T. Clark, W. G. Watson; (Oct. 12) A. J. J. M. Jones; (Oct. 14) A. F. Clutton-Brock, H. P. Griffits, P. M. Morgan, M. C. D. Wilson; (Oct. 15) S. Harvey, H. H. Watson; (Oct. 16) W. M. Blackwood, H. H. J. Cadell; (Oct. 17) B. S. Barker, J. Fawcett, J. R. Hardwick, A. F. O'Connor; (Oct. 18) H. Anderson, J. T. Arklay, A. L. Arnold, C. G. Atherton, B. H. Bannister, G. F. Bell, H. A. H. Christie, C. D. Clark, R. M. Cracknell, K. J. Dallison, P. F. Du Sautoy, H. P. Edwards, J. G. Elmitt, W. Fawcett, F. W. Fisher, A. W. Gadsdon, E. Garthside, V. D. R. P. Gilbert, C. D. Gillies, Y. Gilutz, A. Goodwin, L. L. Green, C. H. Hammer, G. F. Hann, H Hartley-Smith, G. T. J. Knowles, E. N. Johnston, G. Manger, F. Marshall, W. H. Mills, T. Morris, W. A. Oldfield, R. E. Payton, F. S. Pritchard, C. F. Rathbone, L. Reid, W. W. Ridgers, D. S. Scales, J. Scoular-Blacklock, W. G. Sharples, L. C. Sibun, E. V. St. George-Taylor, C. K. Swann, G. T. Teasdale, L. Waish, D. W. Whelan, M. F Whitney, H. A. Williamson, I. H. Wilson, P. D. Wilson; (Oct. 20) H. W. Bartlett, W. S. Heywood-Jones; (Oct. 21) A. A. C. Bellinger, J. H. Bourne, C. H. Brown, J. H. Evans, A. C. H. Groom, D.F.C., R. S. Jones, E. L. Yates; (Oct. 22) R .F. Berrill, C. I'A. Carr, R. B. Cawood, J. B. Collier, E. R. H. Edwards, C. G. W. Eve, D. L. Linton F. P. Northover, V. J. D. Pacco, L. C. Smith, B. C. T. Tomes, J. E. Whitehead, B. R. Whittall; (Oct. 23) H. W. Adshead, M.C.; L. H. Aldridge, C. M. Rounding; (Oct. 24) H. A. P. Disney, A. H. W. MacBean, G. Palgrave Brown, B. P. Tailyour, W. H. Williams; (Oct. 25) C. E. Eden, L. M. Martin-Jones, J. H. Roberts, R. Townsend; (Oct. 26) J. Brodie, A. K. Caris; J. J. Deeny, W. R. Downey, D. M. Edwards, F. Johnson, L. W. J. Newman, C. S Oxlams, H. Robinson, M.M., C. H. Schofield, W. H. Varley; (Oct. 27) A. S. Steward, F. C. Swallow; (Oct. 28) W. G. Ballard, R. L. Mitchell, A. Stephenson; (Oct. 30) L. Courtier-Dutton, I. W. Leiper, D.F.C., F. McD. C. Turner, M.C., D.F.C.; (Oct. 31) W. J. G. H. Child, M.C.; F. P. Lane, J. P. C. Tooth; (Nov. 4) D. H. Bellamy, J. H. Clapham, E. R. Dinsmore, O. C. Gay, A. E. Howard, L. C. Ockenden, J. F. Robertson, A. C. Williams, H. D. Wing. Flight Sergeant:—(Sept. 19, Sen. Sept. 3) R. R. Knight. Sergeant:—(Oct. 30, Sen. Oct. 18) G. C. Wilmot. Leading Aircraftmen:—(Oct. 21, Sen. Sept. 20) P. B. Taylor; (Oct. 24, Sen. Oct. 11) M. E. Wood; (Oct. 28, Sen. Aug. 29) A. E. St. J. Adams. Aircraftmen, 2nd Class (Oct. 29, Sen. Oct. 21) F. V. Coombes, B. Tassell. As Acting Pilot Officers on probation:—(Sept. 16) J. E. D'Aeth. Aircraftman, 1st Class:—(Oct. 12, Sen. Sept. 20) L. J. Coxwell

P/O. C. A. Gibbs, Southern Rhodesian Air Force, is granted a commission for the duration of hostilities in his present rank (Aug. 12, 1940, Sen. July 1).

The undermentioned Pilot Officers on probation are confirmed in their appointments:—(Sept. 9) C. R. Beaston, P. A. H. Belton; (Sept. 19) S. C. Bacon, C. H. Bizzell, R. S. Falk, H. E. Hinchcliffe, C. C. Hirst, C. E. Holman, T. J. Hudson, W. H. Jordan, K. E. Judd, N. E. Lane, W. H. G. Leggett, C. S. Noble, W. G. Peters, F. J. Powell, M.C., A. B. Raymond-Barker, W. M. Smith; (Sept. 20) L. G. Crawley; (Sept. 26) J. Blackmore, G. W. Delaney, F. Garrett, A. H. H. Gilligan, A.F.C.; A. F. F. Jacob, D.S.O.; J. A. Saward, R. D. Stewart, R. L. H. Laye; (Sept. 27) R. A. Angier; (Sept. 23) F. A. Rice; (Oct. 5) R. F. Selby, W. R. Hammond.

The undermentioned Pilot Officers on probation are confirmed in their appointments and promoted to the rank of Flying Officer:—(Sept. 9) F. H. Tyas; (Sept. 19) P. F. Bruce, A. E. Chester, G. J. Cooper, R. N. H. Hughman, A. E. King, A. G. Raven; (Sept. 26) A. W. Amson, J. E. G. Archbald, P. Boulton, D.F.C., S. H. Cary, J. T. Denman, C. E. Dennison, H. G. Ford, T. J. Gardiner, S. G. Glover, D.C.M., S. C. Williamson; (Oct. 10) J. G. Gore, M.M., K. McKenzie; (Oct. 12) J. Newman.

P/O. P. A. Towsey is promoted to the rank of Flying Officer (Sept. 25).

Hon. Flt. Lt. H. K. Zeigler is granted the Honorary rank of Squadron Leader (Nov. 5).

W. A. Sleator relinquishes his Honorary Commission on cessation of duty (Nov. 12).

The undermentioned resign their commissions:—(July 23) Pilot Officer on probation G Wadden; (Nov. 10) Flt. Lt. R C. Norris.

The commissions of the undermentioned Pilot Officers on probation are terminated on cessation of duty:—(Aug. 14) A H. Etessam; (Oct. 11) G. E. Ford; (Nov. 12) H. E. Lane.

Errata.

In notifications of June 18 concerning W. P. Cregg and I. B. Creig. *For* Cregg *read* Gregg, and *for* Creig *read* Greig.

Meteorological Branch.

The undermentioned Pilot Officers on probation are confirmed in their appointments: (Aug. 1) C. R. Crinson, J. Stephenson.

Equipment Branch.

The undermentioned Pilot Officers on probation are confirmed in their appointments: (Sept. 23) R. Goode; (Oct. 19) E. V. T. Knight.

P/O. on probation P. A. L. Cooper is confirmed in his appointment (Sept. 9) and promoted to the rank of Flying Officer (Nov. 9).

The undermentioned Pilot Officers on probation are confirmed in their appointments and promoted to the rank of Flying Officer: (Sept. 14) J. K. R. Howard; (Sept. 18) G. E. M. Stock; (Oct. 10) W. J. Jolliffe.

The undermentioned Act. Pilot Officers on probation are graded as Pilot Officers on probation: (Aug. 19) L. D. Jasper; (Sept. 27) J. Mercer, L. E. Muckett, G. K. Mynett, G. A. S. Watts, A. T. Hanson.

P/O. G. F. Woolf is transferred to the Administrative and Special Duties Branch (Sept. 20).

Accountant Branch.

The undermentioned are granted commissions for the duration of hostilities as Act. Pilot Officers on probation: (Nov. 2) J. J. Appleby, H. T. Armstrong, P. H. C. Burgess, M. Garvin, G. de F. Gibson, T. R. G. Haworth, B. D. Helmore, H. Holman, W. F. H. James, A. Martin, C. G. Moira, T. Ridley, C. G. G. Smart.

P/O. on probation W. M. Erskine is confirmed in his appointment (Sept. 1) and promoted to the rank of Flying Officer (Sept. 5).

The undermentioned Pilot Officers on probation are confirmed in their appointments (Sept. 11) and promoted to the rank of Flying Officer: (Oct. 7) H. V. Barham; (Oct. 10) H. R. Elliston; (Oct. 22) A. R. Pedley; (Oct. 28) E. G. H. Downes.

P/O. on probation A. H. Wilkes is confirmed in his appointment (Sept. 12) and promoted to the rank of Flying Officer (Oct. 19).

The undermentioned Act. Pilot Officers on probation are graded as Pilot Officers on probation (Sept. 21): C. H. Adams, T. I. V. Evans, E. L. Morris, G. W. Gomm.

Medical Branch.

The undermentioned are granted commissions for the duration of hostilities (Oct. 25): As Flight Lieutenants: D. G. Ferriman, D.M., B.Ch., M.R.C.P.; L. D. A. Hussey, M.R.C.S., L.R.C.P. As Flying Officers: A. H. W. Babington, M.R.C.S., L.R.C.P.; C. A. Brockbank, M.R.C.S., L.R.C.P.; R. Cargill, M.B., Ch.B.; J. K. Craig, M.B., B.Ch.; E. T. Downham, M.B., Ch.B.; H. B. Forrest, M.B., Ch.B.; H. Greenburgh, M.B., B.S., M.R.C.S., L.R.C.P.; A. Greenwood, M.B., Ch.B.; D. P. Harris, M.B., B.Ch.; A. R. Lee, M.R.C.P., L.R.C.P.; D. Leon, M.B., B.S.; R. W. J. Maclure, M.R.C.S., L.R.C.P.; J. W. Magill, L.R.C.P. & S., L.R.F.P.S.; D. Matheson, M.B., Ch.B.; H. S. Mellows, M.B., B.Chir., M.R.C.S., L.R.C.P.; E. F. Mulcahy, M.B., B.Ch.; J. D. Pickup, M.B., Ch.B.; N. J. Pratt, M.R.C.S., L.R.C.P.; E. S. Rogers, M.B., Ch.B.; L. A. Sylvester, M.R.C.S., L.R.C.P.; F. L. D. Young, M.R.C.S., L.R.C.P.

The undermentioned Flying Officers are promoted to the rank of Flight Lieutenant:—(Sept. 22) P. H. Lomax, M.R.C.S., L.R.C.P. (Oct. 24) S. Segal, M.R.C.S., L.R.C.P. (Nov. 1) P. C. Conran, M.B., B.Ch.

Dental Branch.

The undermentioned Flying Officers are promoted to the rank of Flight Lieutenant:—(Sept. 22) J. G. Dick, L.D.S., R.F.P.S. (Sept. 25) A. R. Levy, L.D.S., R.C.S. (Oct. 2) G. S. Furniss, B.D.S. (Oct. 16) A. T. G. Garnett, L.D.S. (Oct. 23) S. C. Holms, H.D.D., L.D.S., W. R. J. Wood, L.D.S., K P. Liddelow, L.D.S. (Oct. 31) C. E. Sharland, L.D.S., W. Wylde, L.D.S., M. C. Dutt, L.D.S. (Nov. 14) C. L. Stevens, L.D.S.

Chaplains Branch.

The undermentioned are granted commissions for the duration of hostilities with the relative rank of Squadron Leader:— (Oct. 21) The Rev. D. L. Jones, B.A. (Nov. 1) The Rev A. Raley.

Auxiliary Air Force

General Duties Branch.

The undermentioned Pilot Officers are promoted to the rank of Flying Officer:—(Sept. 3) P. G. M. Hancock (Sept. 4) K. Holden.

Balloon Branch.

P/O. G. H. Dewick is promoted to the rank of Flying Officer (Oct. 17).

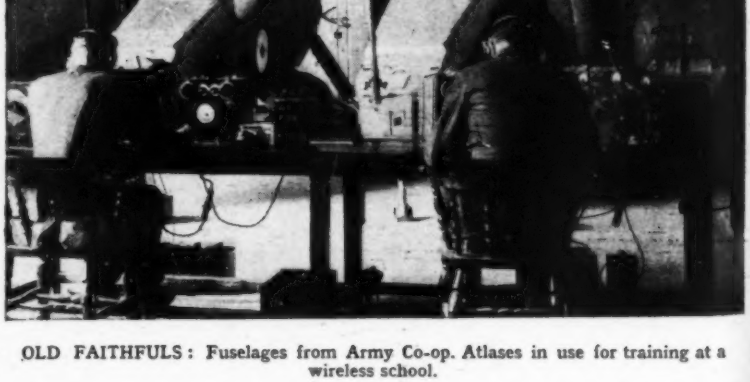
Administrative and Special Duties Branch

P/O. on probation L. S. Litchfield is confirmed in this appointment and promoted to the rank of Flying Officer (Sept. 3).

Women's Auxiliary Air Force

The undermentioned are appointed Assistant Section Officers:—(Oct 10) Sgt. Miss V. More. (Oct. 11) Cpl. Miss H. M. Clements. (Nov. 9) A/CW.1 Miss E. B. L. Adie, A/CW.2 Mrs. St. F. M. Aldridge, A/CW.1 Miss M. A. Brazier, A/CW.1 Miss P. A. Coote, A/CW.1 Miss E. Cunningham Hector, A/CW.2 Miss M. Elliott, A/CW.1 Miss J. Foster, Cpl. Mrs. F. H. Horn, A/CW.1 Miss Y. E. Huth, A/CW.2 Miss J. L. D. McLeay, A/CW.2 Mrs. E. G. Morgan, A/CW.1 Miss R H. Price, A/CW.1 Mrs. O. C. A. Risdon, A/CW.2 Miss D. J. Tyler.

The undermentioned Assistant Section Officers relinquish their appointments on the dates stated:—Miss P. S. Rollo (Sept. 15), Mrs. D. J. Robertson (Nov. 1).



OLD FAITHFULS: Fuselages from Army Co-op. Atlases in use for training at a wireless school.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

THE "SLIP-WING" SCHEME

Bomber versus Fighter

MR. PEMBERTON-BILLING'S stimulating article must have given many of us a well-needed jolt. Let us hope that his ideas will be put to fair trial without delay and that his launching system proves practical under service conditions.

I cannot help feeling, however, that the long-range bomber will always prove slower than the short-range fighter. I imagine that "P.-B." aeroplane built for a duration of 4 hours and carrying adequate armament, but not *five tons* of bombs. The wing area and fuselage size would then be substantially smaller and the speed greater. The "P.-B." bomber would fall a prey to a machine of this type, just as the Heinkel 111, the Dornier 215, the Junkers 88, and the Messerschmitt 110 fighter-bombers have fallen to the Hurricane and Spitfire. We must not fail to profit by the tactical mistakes of the Germans in the past historic months.

Power-operated turrets as used on British bombers must reduce performance by breaking the streamline shape of the fuselage. However, remotely controlled guns in streamline mountings have already been described in *Flight*. Bomber crews must be provided with means of self-defence if they are to discharge their duties without excessive strain. Again, a bomber must always have reasonable manœuvrability, as evasive action is needed to counter searchlight action, A.A. fire, and fighter attacks.

All success to the "P.-B." design in its essentials. British bombers must be capable of striking at targets at much greater distances from their bases.

E. D. LACY.

West Ewell.

NOISE OF ENEMY AIRCRAFT

Is Fluid Flywheel Responsible?

YOUR article on the D.B.601A supplies a simple explanation of the peculiar "fluctuating warble" given by German bombers when cruising at low speed and moderate altitude. The note is a result of the "fluid flywheel" system of supercharger drive.

A steady "warble" is given by two engines when the difference between their speeds is constant. In the case of the D.B.601A boost (and therefore engine speed to a certain extent) is partially controlled by an altitude capsule. It is reasonable to assume that this control operates somewhat jerkily as altitude is changed. With two engines set initially at equal speeds, therefore, when the altitude is changed the speeds of both engines will not be affected in exactly the same manner. A varying difference in speed will arise, and one engine will sometimes go faster than the other and vice versa, producing a "fluctuating warble" or "fluctuating beat."

In support of this idea I may say that I have not heard a "fluctuating warble" on either very high or very low machines, and both these cases make the altitude capsule inoperative. Moreover, the peculiar note appears to occur mainly with machines which are slowly circling and which might therefore be expected to be varying in altitude for the purposes of reconnaissance.

A. G. SMITH, B.Sc.

THE FLYING SEARCHLIGHT

. . . and Other Matters

MR. C. T. NANCE, in his original correspondence, made a very good analysis of the sound components that are audible from a 'plane in flight, but I am inclined to disagree with his classification of resonance as an afterthought. He rightly locates airscrew noise as the greatest component, but windage noise and resonance make a good second.

Secondly, he makes a statement that a flat spot occurs when the fundamental and harmonics are out of phase by 90°. The flat spot occurs on a second harmonic—that is to say, the octave above fundamental, when the fundamental is 90° out of phase and also when it is 270° out of phase. But the flat spot on the fundamental occurs at 180° phase displacement. This shows that there are two flat spots on the octave to one on the fundamental throughout the "slip" cycle. Hence the higher the harmonic integer the higher the phase beat frequency of the harmonic, which at high values could remain undetected by untrained ears.

Mr. Webster suggests the possibility of direct injection being a cause of beat due to unequal supply of fuel to the cylinders. Direct injection is not likely to cause unequal fuel supply, but, owing to lack of premixing in a turbulent draught, uneven combustion is highly probable, causing fluctuation of speed. This fluctuation of speed, however, would be irregular and would not cause any regular phase beat between the two airscrews.

Mr. G. A. L. Lis introduces an interesting point which cannot be denied, and that is that sheer altitude amplifies phase beat. There must be a reason for this; quite possibly it is due to the radiations becoming absorbed in each other after entering the denser atmosphere.

That "dreadful" noise from a Harvard trainer is unique, but it is definitely directional, being parallel to the airscrew radius. Perhaps some reader does know the cause of it. It is definitely higher than the airscrew pitch by a few octaves.

Messrs. B. L. Teley and R. W. Ball suggest radio location of hostile aircraft. With present knowledge it is not possible. The enemy pilot is not likely to use his radio over our lands, and all plugs and ignition leads are very carefully screened in order to prevent interference with his own receiver. Neither trumpet nor microphone sound locators could be set away from the slip stream. By trying to eliminate your own slip stream frequency you also eliminate any neighbouring frequencies from enemy aircraft.

The trumpet sound locator, by the way, is not a mere set of trumpets fitted with stethoscopes. It is a scientifically designed instrument which takes into account such matters as wavelength, relative position of 'plane in flight, temperature refraction, etc.

Nevertheless, I am not condemning the idea of the flying searchlight, but I cannot picture a 16 kw. arc working with safety on any present-day aeroplane.

Ex-R.E.

SUB-CONTRACT DRAWINGS

Provision Made for Amplification

SINCE my remarks of 24th ultimo may have been misunderstood by correspondent K. T. B., I shall appreciate further use of your columns to clarify the points at issue.

First, let me correct any idea that the last paragraph of my letter was intended to cast reflection, as K. T. B. implies, on everybody from commercial enterprise who is now engaged on aeronautical production. Possibly K. T. B. is unacquainted (though I must doubt this) with the type of individual who regards only as "Red Tape" the very essential drawings procedure of Air Ministry (M.A.P.) necessary to ensure the efficient functioning in its world-wide ramifications of the Royal Air Force spares and maintenance services.

It was to these persons that my remarks applied and my statement that "Difficulty often arises, etc.," did not infer that it was always the case.

Concerning amplification of drawings, the writer is well aware that provision is made for it in an A.D.M. which, though current, was probably drafted prior to the extensive expansion of sub-contracting. But in the present conditions does K. T. B. suggest that the varying processes of assembly in a number of firms each producing the same unit should be allowed to cause extensive amplifications to the parent firm's set of sealed drawings? If so, I venture to suggest that some of our leading chief designers would soon be voicing strong objections to having their designs manœuvred to suit every other firm's ideas of production. Surely the processing for production can be taken care of by a competent staff of planning and process engineers.

One of the main difficulties arises from the conviction of many persons from commercial firms that aircraft can be put together on exactly the same mass production principles as the motor and other industries. This then gives rise to the desire for so called "amplification" of drawings by the introduction of innumerable sub-assemblies, each with its separate materials schedule, a system which has many disadvantages and which does not lend itself to the aircraft drawing office procedure.

Since contracts and the inspection by A.I.D. are normally based on a set of sealed drawings controlled by D.I.S., the assertion that a separate set may be used requires further examination for accuracy, particularly as the A.D.M. relevant to this subject states quite definitely that it is contrary to the conception of the system that more than one set of master drawings, from which copies may be taken for manufacturing purposes, shall exist.

H. W. E. C.

THE INDUSTRY

Vaughans acquire Houghtons

EDGAR VAUGHAN AND CO., LTD., the oil specialists (who have been associated with E. F. Houghton and Co. for the past 40 years), have recently acquired the undertaking, business and goodwill of E. F. Houghton and Co., of England, Ltd., as well as the manufacturing rights and trade names of all Houghton products for Great Britain.

Sperry Weather

THE advertisement "Sperry Weather" which appeared in our issue of Oct. 10 has been so universally admired that the Sperry Gyroscope Co. have had a number of prints made on art paper. These are available to any of our readers who care to send threepence postage for each copy required to The Sperry Gyroscope Co., Ltd., Great West Road, Brentford, London.

Paint Remover

IN these days, when speed is an essential feature in the reconditioning of aircraft and airscrews, the use of a reliable paint remover becomes a necessity. The Quickstrip Chemical Co., Ltd., Wilton Street, Bradford, specialise in paint removers which are guaranteed free from acids and alkalis.

Quicker-Strip—one of three grades—acts on ordinary air-dried paint or varnish in ten minutes after application; on cellulose and coloured stove enamels in five minutes, and even flint hard stoved black enamel can be removed by three applications at about eight-minute intervals.

Since the Quick Strip compounds contain no acids they are non-injurious to the hands, but neither linoleum nor silk is proof against it.

Welding Metal to Glass

FOR the first time in history a method has been perfected in Britain for welding metal to glass. The glass used is of a specially toughened type, and the metals are aluminium and certain alloys containing a high percentage of aluminium. The process is at present used for making electric heaters.

These are made by spraying aluminium, which is in the form of wire, by means of a "Schoop" gun, in a zig-zag pattern on to the specially heated glass. An electric current passed through the long conducting path so formed heats the aluminium pattern and, by conduction, the glass. A heater is normally formed of two such plates mounted back to back in a framework, with the live metallised strips inside. This arrangement protects the user from shock. These "glass-heaters" have been tested over a long period and have emerged satisfactorily.

The process is also being used for soldering metal discs or bolts on to glass. Tests have shown that very great strength is obtained in such a joint. The metal adheres so firmly that any attempt to dislodge it breaks the glass instead of the joint between the metal and the glass.

The soldering of metal to glass has been the dream of glass technologists for years, but it is only the joint inventions of toughened glass and metal spraying which have made the process a practical one. The soldering of metals to glass can be used for furnishing and fittings and has been used instead of complicated mouldings for radio frequency condensers. It is also possible to join glass to glass by the same process.

The famous glass concern of Pilkington Brothers, St. Helens, is responsible for this new process.

A. T. Wall Retires

J. SAMUEL WHITE AND CO., LTD., the shipbuilders of Cowes, regret to announce that Mr. Arthur Thomas Wall has been compelled to relinquish his duties as managing director of the company on account of ill-health. He has held the position since 1933, and during that period the firm has carried out a great deal of important work for the Admiralty, and he was personally responsible in obtaining valuable contracts for the building of destroyers for the Polish and Brazilian Navies.

Aluminium Alloy Specifications

TO meet a widely felt need, the technical staff of the Northern Aluminium Company Limited have compiled a fully classified summary of current D.T.D. and B.S. specifications relating to aluminium and aluminium alloy products. This publication should be useful to all engaged in working to light alloy specifications.

The number of such specifications is relatively large, and the booklet, which is of a convenient size, has been compiled in order to provide ready reference by technical personnel in the numerous manufacturing concerns now working for the first time on light alloy materials to standard specifications.

The full range of British light alloys as specified at present is classified according to the various forms in which each is produced, namely, ingot, sheet and strip, bars and sections, tubes, wire and rivets, forgings and castings. The appropriate D.T.D. and B.S. specifications are shown under each heading, with the proprietary nomenclature and tables of chemical composition and mechanical properties. A tabulated summary of proprietary alloys in alphabetical order, showing the corresponding specifications and the forms of material to which they apply, is also given.

Copies of this publication may be obtained free of charge by applying to the Research and Development Department of the Northern Aluminium Company Limited, Banbury.

Arthur Lee Fighter

WAR Weapons Week has inspired a Sheffield firm, Arthur Lee and Sons, Ltd., manufacturers of steel bars, strip, and wire, Bessemer Road, to make the Air Ministry a gift of the amount necessary to purchase a fighter.

Mr. Percy W. Lee, chairman of the company, explains that in addition to a wish to help the city's War Weapons Week the firm has been prompted to make this gift for the two following reasons:—

"To mark our appreciation of the wonderful work that has been done by the R.A.F. in the defence of this country and the heroism of their personnel in the support of our Armies in France (particularly their untiring efforts in the rescue of our forces from Dunkirk) and also their assistance to the Royal Navy in their most arduous duties.

"In recognition of the wonderful fortitude displayed by the people of this country under the intense and indiscriminate bombardment by our enemies, and in this connection we would particularly like to include the people of London, who have had to bear the brunt of the attack."

Mr. Lee states that the firm had considered inviting their employees to contribute to this gift, but decided that, as they were already subscribing generously in other ways, particularly in the form of savings certificates, it would be better to leave them to make their own contributions to the week's effort.

AERONAUTICAL PATENT SPECIFICATIONS

(*Published September 5, 1940.*)

1939.

3544. BAYERISCHE MOTOREN WERKE AKT.-GES. Means for regulating internal-combustion engines for aircraft (524,645).

3566. TELEFUNKEN GES. FUR DRAHTLOSE TELEGRAPHIE. Direction-finding aerial systems (524,652).

3567. TELEFUNKEN GES. FUR DRAHTLOSE TELEGRAPHIE. Radio direction-finders (524,653).

13875. EVEREL PROPELLER CORPORATION. Variable-pitch screw propeller (524,491). (*Published September 12, 1940.*)

1938.

32093. KOLLSMAN, P. Direction-indicators and navigating instruments for use in aircraft (524,801).

12694. UNITED AIRCRAFT CORPORATION. Screw propellers, and control mechanism therefor (524,923).

1939.

1269. DOWTY, G. H. Aircraft undercarriages with resiliently mounted landing elements (524,929).

2734. GENERAL AIRCRAFT, LTD., ARCHDALE, G. E., and BROWSE, C. W. E. Folding-wing aircraft (524,864).

2806. ARENDS, H. M. Control surfaces of aircraft (524,865).

3767. AMIOT, F. Stressed-skin fuselages or nacelles for aircraft (524,721).

4125. SWOFFORD, P. J. Parachutes (524,793).

4308. SPERRY GYROSCOPE CO., INC. Explosive projectiles (such as bombs or aerial torpedoes) and electrical apparatus for controlling their movement during flight (524,876).

4471. ALMANDOS ALMONACID, V. Mechanical transmission systems for aircraft (524,911).

5460. HAMMOND, E. V. Means designed to facilitate the take-off and landing of aircraft (524,913). (*Published September 19, 1940.*)

1938.

32995. IMBER, J., and HEBARD, H. C. Aerial bomb and method of using the same as a defence against aerial attacks (524,979).

1939.

1562. DEWANDRE, A. Device for the automatic correction of the position of the sighting line of a machine gun mounted in an aircraft or other turret (524,997).

1874. DUNLOP RUBBER CO., LTD., BEHARRELL, G. E., WRIGHT, J., and TREVASKIS, H. Fluid-pressure apparatus for controlling the operation of brakes for aircraft (525,266).

4540. ARADO FLUGZEUGWERKE GES. Supporting wings for aircraft (525,012).

4543. VICKERS-ARMSTRONGS, LTD., and ELLIS, D. L. Means for assisting the take-off of aeroplanes (525,015).

4544. BLACKBURN AIRCRAFT, LTD., and TRUYENS, C. P. J. Arrester gear for aircraft (525,016).

4648. AMIOT, F. Aircraft engine cowlings or nacelles (525,037).

5776. HEYLAND, A. H. Aircraft landing-gear (525,107).

13813. QUILTER, J. R. C., and GREGORY, J. Parachute packs (525,118). (*Published September 26, 1940.*)

1938.

32986. ROSE, W. K. Aerofoils for aeroplanes (525,400).

36837. ROSE, W. K. Lateral control means for aeroplanes (525,401).